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Yang Liu

Abstract

The aim of this thesis work is to develop a performance improvement model template which supports multinational corporations in their daily operations.

This has been achieved through literature review and four case studies. With analysis and synthesis, a complete performance improvement model template is carried out based on balanced score card which can be considered as an instruction or reference for improvement work in multinational corporations.

After experienced the transformation from industrial age to information age, sustainable development and continuous performance improvement has become an essential task in front of management leadership in multinational corporations. How to equip energetic organization with innovation, learning atmosphere and knowledge management has been put in primary position in terms of organizational capabilities. How to effectively and efficiently use organizational resources, how to measure, control and conduct daily operations within business process have come into our concerns in terms of manufacturing and service delivery. Market reaction, stakeholder and customer benefit, organizational profit as well as environmental and social impact related has become more and more important in today's business.

An evaluation of performance improvement theories and methods such as Learning Organization, Knowledge Management, Triple Bottom Line, Six sigma, etc, together with analysis and synthesis of their implementations in four case studies, a series of critical performance factors and a process measurement model is concluded. Based on balance score card and development trend in future, a performance improvement model template is carried out as result in this thesis for practical instruction and reference use.

The performance improvement model template has included the driving force of improvement theories at present, and has taken industrial experiences from case studies in terms of manufacturing and service delivery. Performance improvement with sustainable development is a long-term task in the world. Multinational corporations should always update their core value, management strategy and operational process through continuous efforts in order to go ahead in the market.

CONTENTS

Figures and Tables

Chapter 1 Introduction

1.1 Background

In today's workplace, performance improvement and the role of performance management is an increasingly popular topic, companies all over the world are seeking for a better performance, which stands for strong competitiveness in the market, and which in turn will generate more profit and benefit.

By experiencing the transition from industrial age to information and technology age, organizational management leaderships gradually realize the importance of continuous and sustainable organizational development. Resource accessibility is no longer the primary limit for organizational success. How to organize the resources in an effective and efficient way, execute better business strategy, provide more with less in the competitive environment, reach alignment with stakeholders for mutual benefit, identify and develop organizational capability has become critical task among leadership.

When we concern about performance improvement (PI), there are so many aspects related such as production, logistics, quality management, financial management, environmental and social impact, human behavior, etc. as it is such a comprehensive and complex work. Where to start with PI work, what to improve and how to improve organizational performance? By this research, we may find the answers to these questions.

1.2 Problem and challenge

Performance improvement in multinational corporations is a continuous long-time process. But unfortunately, it is often crisis driven, which can lead to a hasty decisions such as outsourcing even though the improvement potential can be greater with PI[1].

Customer needs and market value is critical in organizational performance, and these values are created in the process of operation within an organization. So performance improvement should be conducted at operative level, to identify value stream and reduce waste. But many problems in performance improvement are related to poor measurement, insufficient planning, resistance to change and lack of competence preparation, etc.Here we list some main challenges of PI in MNCs:

1. Specialist dependent

Many methods in performance improvement are expressed from the view of specialist, including many statistics and routing issues, which is hard for non-specialist and blue-collar workers to fully understand. Thereby, it's hard to get support and the implementation process will be affected.

2. Lack of support

When an improvement strategy including many new ways or new technology, once they are implemented and the management level feel lost of control, the resistance to change will be high and the whole PI will fail. Improvement method should be compatible with existing ones, making up the missing or failed parts.

3. Competence or knowledge

The competence about the new improvement work is always neglected, which may cause further effect on PI failure due to resistance and insufficient knowledge and skill. New PI method will be more easily accepted and implemented if competence is increase in advance.

4. Implementation

There is other factors influence the process of implementation besides lack of support, competence and specialist dependency. It is always another group of people responsible for PI methods execution, and some deviations are inevitable.

5. Measurement

An accurate measurement is essential for right solutions to the problems. Any methods without sufficient measurement will lead to vague problem description, thus improvement in deviated direction.

6. Choice of improvement object

It is important to choose the right improvement object for successful improvement work: Not only with great potential to improve but also accessible to implement.

The challenges listed above can be used as an evaluation or assessing basis, from which we can abstract some critical influencing attributes and performance improvement methods to be fulfilled to solve the problems above.

1.3 Scope

This research reviews performance improvement theories and methods identify drivers and trends in relation to performance improvement, and connect the knowledge to industrial cases.

This thesis will also analyzes four case studies in practice, one in automobile industry, one in pharmaceutical industry, and other two in quick service restaurant (QSR) and oil and gas industry respectively. Analysis and study comparison among them will help to identify and abstract some critical attributes, benefits, and how they conduct performance improvement work in Multinational Corporation.

Combined with theories and methods, we will give a performance improvement model template as a reference and recommendation regarding better performance in practical use and overcoming challenges.

1.4 Research approach and methods

Basic theoretical methods concerning PI will be carried out in the method of literature studies of reports, documents, and books. Based on the theories concluded in the literature study and in the interviews with experts several case studies will be conducted. Through analysis and synthesis, the new PI concept will be evaluated in validity and reliability. The whole master thesis will be accomplished in the form of academic paper.

1.5 Limitations

Some aspects such as performance improvement in product design and development is not included in this thesis since PI is such an extensive topic, we mainly focus on the operation process. And the case studies do not cover all industrial areas. This thesis only provides a PI model template for general use in practice, not specialized in typical type of business. Thus the evaluation of the strengths and weakness of this PI model template in a typical type of business is not mentioned. Due to lack of data, the analysis of case studies is more of description than data, thus the analysis is more qualitative rather than quantitative.

Chapter 2 Literature review

In this chapter, we are going to review some latest performance improvement theories, and basic improvement methods in the areas of logistics, quality, production engineering and human behavior areas, as well as some evaluating parameters for these theories and methods.

With the exponential growth of information and technology in 1990s, globalization of economy and liberalization of trade market have become the new trends and conditions in market place. Competition is dramatically increasing with respect to quality, price, service and delivery between multinational corporations. Removal of distance barriers, international cooperation, and technological advance has made this situation more complex. Traditional methods to improve organizational performance in terms of financial measures are adequate for industrial age, but, no longer enough to guide and evaluate organizational performance in information and technological age. Therefore, a new set of performance improvement methods are required to complement under this new condition.

Learning Organization, Knowledge Management theory and “enterprise engine” Innovation has become “new” driving forces of competitive performance of under modern business condition. They provide companies with strong inner capabilities of both leadership and workers in manufacturing and service delivering.

Resource-based theory with performance improvement methods in logistics, quality, production engineering and other processes give us a well-organized mechanism to make full use of the materials, labor, capital, and time, etc in daily manufacturing and service delivery process. What parameters to measure, how to conduct root cause analysis, how to find solutions to realize effectiveness and efficiency has been addressed in here.

Developing long-term sustainable organization has been widely accepted widely all over the world. Triple Bottom Line, as a core valued theory for management leadership in multinational corporations, is focusing on balance among financial benefit, environmental and social issues. Similarly, Stakeholder Theory is focusing on consensus decision making and mutual benefit for the stakeholders. And the following we will take a look at these methods and theory in detail.

2.1 Performance management and innovation theory

- **Performance Management**

In the rapidly changing economic times, many corporations tend to look into their internal capabilities for performance improvement and productivity increase, instead of waiting for the external improvements such as market growth, information and technology advances.

As a systematic application aimed at optimizing performance within an organization, performance management is defined as [2] “a process for establishing a shared understanding about what is to be achieved, and how it is to be achieved, and an approach to managing people that increases the probability of achieving success”

In the past, performance improvement is conducted by the immediate supervisor directly. However, with the development of organization structure, such as decentralized workforces, enlarged spans of control, lack of direct experience and evolving performer expectations, it’s become more and more common to see that employees are responsible for determining the performance management directly.

As for the improvement in performance management, there are three exceptionally reliable, valid and useful theories with clear relation and sufficient support: Goal-Setting Theory, Control Theory, and Social Cognitive Theory [3][4][5].

In Goal-Setting Theory, they point out that the importance of the goal is strengthened by the performer’s participation. Difficult and specific goals result in a higher performance commitment compared to vague do-your-best goal.

Control Theory focused on the feedback elements of performance management approach. It is apparent that performers taking charge of their own feedback loops can obtain necessary feedback more timely compared to the past supervisor or manager top-down pattern for adjustment to negative discrepancy. But at the same time, sufficient self-regulation is required to control the discrepancy between standard behavior and actual behavior.

Social Cognitive Theory, Bandura indicates that human motivation is influenced by three elements: work environment, what the performer thinks and what the performer does. Positive self-beliefs of efficacy, right skills and abilities lead to strong performance. Organization should try to set up self-efficacy mechanism, make the performers to set and react to goals that they think of themselves, monitor and judge the performance process, and correct behaviors. It is proved that people who regard

themselves as highly capable of performers tend to embrace difficult goals with above average[6].Thus, strong self-efficacy leads to a higher level of goal challenge and much effort with perseverance and resilience in the pursuit of established goals.

However, there are still many failure cases in the implementation process of performance management. It is because that many corporations tend to cling to the most common theories rather than apply the ones which are more fitted to the circumstances of their own corporation environment. But, as stated above, tight feedback system and self-efficacy can lead to a higher goal achievement. From the performers' perspective, a more serious attention and control is obtained in performance management, which is also known as self-directed performance management. To include, successful implementation of performance management system should follow the disciplines below:

1. Conduct a cautious study of the existing performance management system and the related organizational culture.
2. Identify a strong theoretical support based on the organizational culture.
3. Focus on motivation, which is an important factor of performance management and an critical contributes to a high level of performance.
4. The theory of self-directed performance management enables a more flexible mechanism in both cost-saving and motivating employees.
5. The organization should have an open and active communication access, both in organization goal, job expectations and feedback control.

- **Innovation**

Besides, as to organizational performance improvement, organizational innovation plays an important role as an intermediate link between market orientation and organizational performance. As illustrated in the figure below: it incorporates customer, competitor orientation and inter-functional coordination, accommodates the uncertainties (market and technological turbulence) in its entrepreneurial environment. It contributes to the improvement in organizational performance by integrating technical and administrative changes into organizational structure in the end.

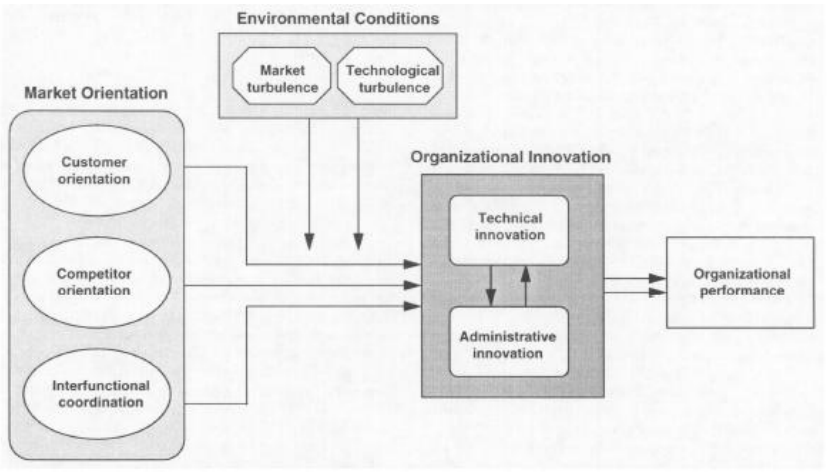


Figure 1 Hypothesized Mediator Role of Innovation on the Market Orientation-Performance Relationship [7]

As for organizational innovation, there are many typologies of innovation posted before: product/service versus process innovations; technological versus administrative/managerial innovations and radical versus incremental innovations. For the most widely accepted technical versus administrative innovation, a structure model is carried out with indicating factors included as below:

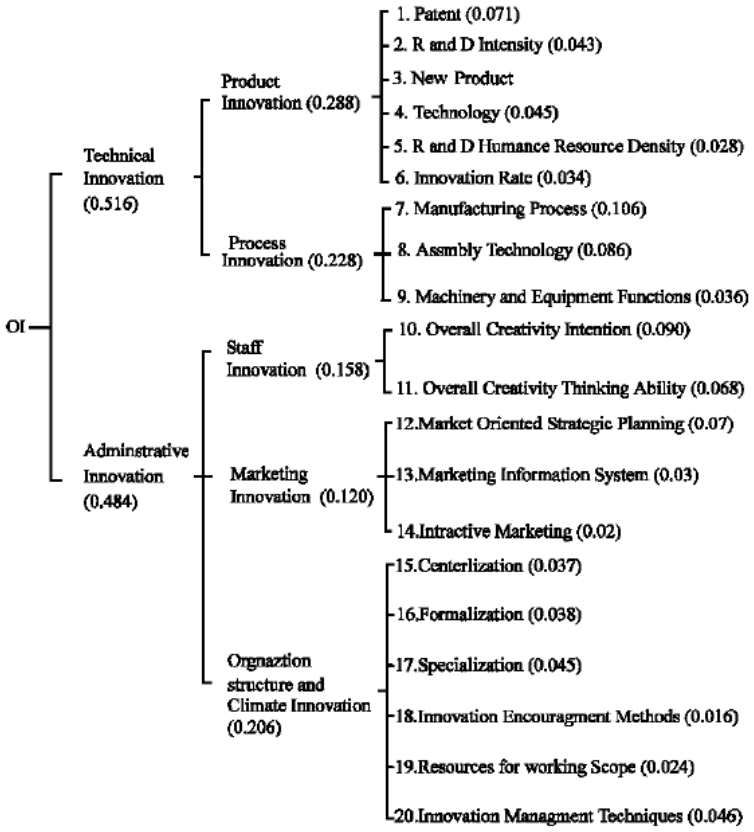


Figure 2 Hierarchical Structure and Indicators[8]

In this hierarchical structure, two system dimensions, five measurement dimensions and twenty secondary dimensions are included with their corresponding weights. From this, we can see that product innovation, process innovation and organizational structure and climate innovation is given special emphasis.

For organizational performance, there are no definite guidelines to measure. But efficiency and effectiveness are always two key elements in performance measurement which is reflected by cost-benefit/input-output ratio and revenue generation respectively. Initially, technical innovations such as product and process innovation are designed to ensure organizational competitiveness in the market, thus, higher technical innovations will result in higher levels of organizational effectiveness; With the development of market maturity, size of organization and awareness of innovation, more wider focus is given on the administrative innovation such as staff, marketing and organizational and climate innovations, which are aimed to enhance organizational coordination, thus, higher levels of administrative innovation will lead to higher levels of organizational efficiency.

In conclusion, innovation in both technical and administrative aspect will facilitate the integration in organizational structure and culture, thus generates and contributes to the improvement of organizational performance in the end.

2.2 Learning organization theory

In the rapid changing economics volatility and uncertainty, many organizations are striving to survive and keep competitive. Organization learning has been considered as one of the strategies of reaching long-term organizational success.It is a process or capacity within the organization which enables it to acquire, access, and revise organizational memory thus providing directions for organizational action.

Learning organization is defined as [9]an organization where people continually develop their capacity to achieve results they desire, where new patterns of thinking are nurtured, collective aspiration is set free and where people are continually learning how to learn together. A learning organization has three basic characteristics as below: Commitment to learn: learning within an organization can start on the condition that the organization believes in learning.

1. Open-mindedness: an organization must be open to face the challenges of existing situations.
2. Shared vision: it gives the direction of development and learning.

A famous organization learning model is originally suggested by Dewey in 1993, with complement by Bennis, Deming, Handy, and Shewhart, finally came out as below:

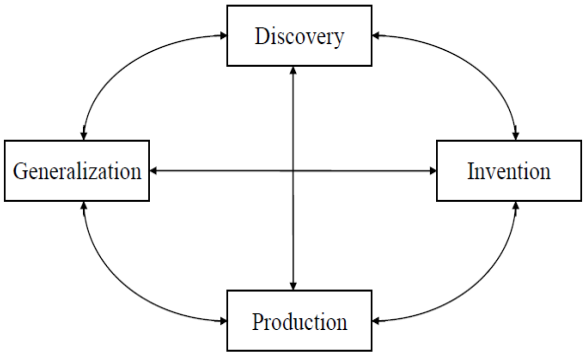


Figure 3 Organization Learning Processes[10]

This organization learning model consists of four steps according to human's acknowledgement process: discovery, invention, production and generalization. They are closely connected as a iterative loop and internally impacted by each other:

1. Discovery: the gap between current and desired state is identified to be the driving force of organization learning. It is a problem-setting or problem-formulation process with analysis of threats and opportunities both in internal and external environments.

2. Invention: a problem-solving and decision-making process regarding the errors or gaps detected in discovery process by using methods such as brainstorming, benchmarking, synthesis and prioritization.

3. Production: it is a process that transmits the invented solution into action. For example, coming up with an approach to solve conflicts, carrying out a new production process and launch a new product. It is the most critical element in organization learning process according to the organizational action-oriented nature.

4. Generalization: a conclusion process of what has been discovered, invented and produced, integrate, disseminate, and apply these knowledge to other situations across time and space. Training, development activities, standardization, institutionalization can generalize the knowledge widely within the organization, embedding it in the systems, procedures and products.

In order to evaluate the organizational learning process, here we carry out a table

with several assessing parameters for practical use as below:

Parameters	Brief description
Leadership	Top leadership awareness and contribution
Communication	Information availability, dissemination and alliance
Culture	Employee involvement, collaboration, collective learning
System And Structures	Open ,accessible environment with rewards and recognition
Teams	Self-managed teams with trust and share in long-term learning

Table 1 Evaluating Parameters of Learning Organization[11]

Through these interacting and overlapping steps in organization learning process, organizational members will have a better understanding of organization and its surrounding environment.Also outcomes such as changes in values and assumptions, skills, systems and structures, core competencies, organizational innovativeness and competitiveness, corporate success, and employee satisfaction will gradually contribute to the improvement in organizational performance in financial as well as nonfinancial terms.

2.3 Knowledge management theory

Nowadays, knowledge plays a critical role in different competitive advantages of organization and has been recognized as a strategic resource for performance. The value of the company largely depends on the competitive quality of its knowledge based intellectual capital, assets, and how effectively and efficiently these assets been applied in operational activities.

Thus knowledge management is defined as [12]a managerial paradigm which assumes that knowledge is at the basis of organizational competitiveness and, from the explicit and systematic adoption and implementation of methods, tools and techniques, for evaluating and managing knowledge assets derive the ability to generate value for company’s stakeholders.

In 2001, Mary and Schiuma carried out a knowledge management process which concludes different aspects and propose, providing us a comprehensive scope to knowledge management as the figure shows below:

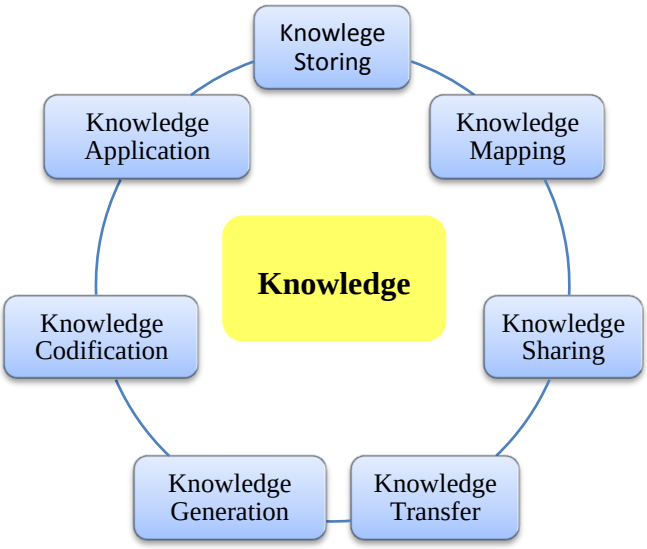


Figure 4 Knowledge Management Processes[13]

They identified 7 tightly interrelated and reacting key processes: knowledge, generation, knowledge codification, knowledge application, knowledge storing, knowledge mapping, knowledge sharing and knowledge transfer. A good knowledge management will facilitate the knowledge application in decision, thus resulting in an improvement in organizational performance.

In order to instruct managers to an effective and efficient knowledge management process, a knowledge manage assets value spiral is introduced as below:

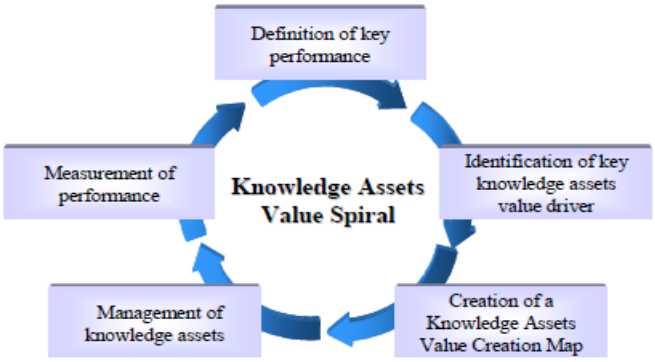


Figure 5 the Knowledge Assets Value Spiral [12]

1. Definition of key performance

In the first stage, we should identify the key performance related to the organizational strategy, taking into the stakeholder needs and requirements. A series of specific performance objectives should be set up within reach but beyond current knowledge level according to the key performance.

2. Identification of key knowledge assets value driver

In this stage, those factors or resources which have an important influence on organization performance improvement should be identified and represented in a hierarchical structure, with general objective, specific objectives and knowledge resources respectively.

3. Creation of a knowledge assets value creation map

Connect the knowledge resources fixed at precious analysis with nodes and arrows to show how these key knowledge assets value factor are linked to the performance objectives and how they interact with each other to create value in the form of knowledge assets value creation map showing below:

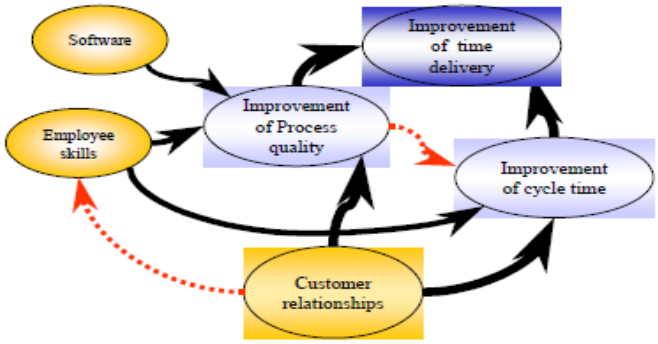


Figure 6 The Knowledge Assets Value Creation Map [12]

In this map, the width of nodes/arrows and hatched/continuous arrow indicates the weight and links of dependence between elements.

4. Management of knowledge assets

In this stage, knowledge assets value factors are maintained and managed for developing according to their tacit or explicit nature in the process of knowledge management. Also other technological, structural and cultural influencing factors should be taken into consideration in this process.

5. Measurement of performance

In this process, managers check whether their strategic assumptions codified in the knowledge assets value creation map is right and how the performance been improved due to the management of knowledge assets value factors. If not, they may go back to identify other different knowledge assets value factors and improve the management method of knowledge assets.

Similarly we carry out a table with several knowledge management assessing areas for practical use as below:

Areas	Brief description
KM in people	Awareness, participation, reward and recognition
KM in process	Effectiveness of KM policy, strategy, process and integration
KM in technology	-Network, data and information management -Explicit and tacit knowledge management -Artificial intelligence and knowledge engineering techniques -Integration in knowledge management technology
KM in knowledge	-Knowledge classification, capability areas -The organization of knowledge based on knowledge map, meta knowledge, taxonomy, etc.

Table 2 Assessing Areas in Knowledge Management[14]

The relation between knowledge and performance can be interpreted in the following figure:

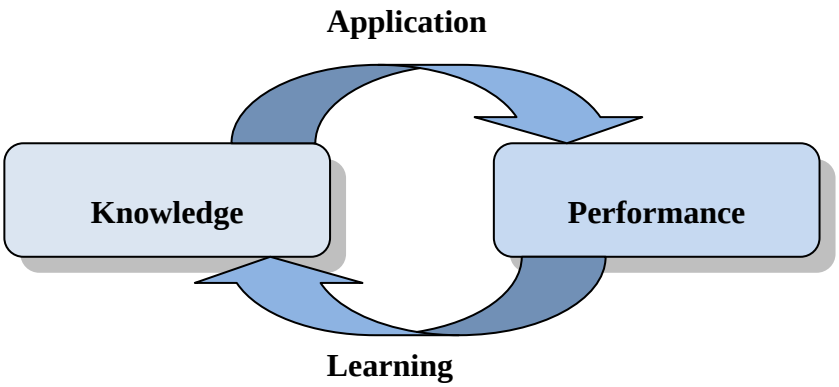


Figure 7 the Knowledge/Performance Loop[15]

Knowledge feeds the performance, and it is also derived from performance through learning process. Knowledge management is the engine to drive continuous improvement in performance he better knowledge management we conduct, the better performance will be obtained in the end.

2.4 Resource-based theory

A firm is considered to be constructed of physical capital resources, human capital resources and organizational resources.Resource-based theory is developed to

help organization achieve sustainable competitive advantages (SCA) over other competitors thus to get a better performance in market. These resources include both tangible resources such as financial, organizational, physical and technological resources, and intangible resources such as information, knowledge and dynamic capabilities.

The resources based theory has two fundamental assumptions about resources to explain how they generate SCA and achieve better performance over other corporations.[16]First, the bundle of resources in control may be heterogeneous. Some corporations perform better in certain activities when they possess unique resources. With these unique resources, they are able to deliver greater benefits to their customers at a given cost or deliver the same level of service at a lower cost thus to create performance differentials. Second, it is the immobility assumption that the benefits from heterogeneous resources may persist overtime due to the difficulty of trading resources across corporations. Either that a firm possesses valuable resources that other firms do not, or that it is too costly or difficult to imitate these resources, may contributes to this persistence of differences in resource.

The assumed heterogeneity and immobility are just two essential, but not sufficient factors for SCA. According to Barney's VRIO framework, a corporation's resource must, in addition, fulfill the following five criteria:

1. Valuable: the resource must be strategically valuable to the corporation, either increase its net revenues or lower its net costs. In the parlance of SWOT frame work, resources are valuable if they enable the corporation exploit opportunities or neutralizing threats.
2. Rare: the resource must be unique and rare among competitors
3. Imperfect imitability: the resource must be hard to perfectly imitate or copy
4. Non-substitutability: competitors cannot replace it with another alternative resource to achieve the same result.
5. Organized to capture the value: the corporations must be qualified to fully exploit the competitive potential of the resources and capabilities, which is to say, that poor organizational processes, policies, mechanisms and procedures may undermine the SCA of the resources.[17]

All these above can be concluded in a figure below:

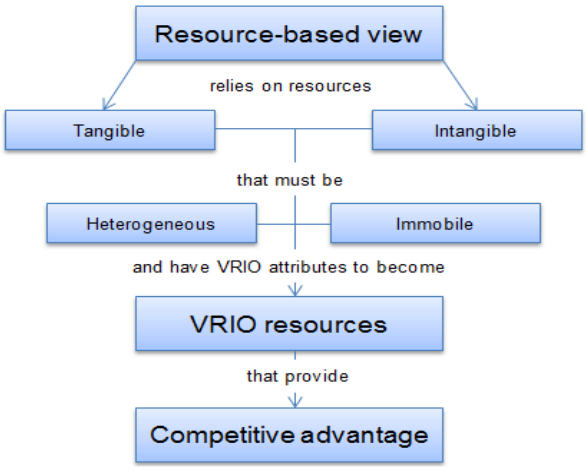


Figure 8 Resource-Based View [18]

The resources and external competitive environment determine the strategy. Strategy can be considered as the deployment of the resources in competitive environment aiming at capturing SCA. Meanwhile, the strategy relies on and is constrained by the resources, and taking the development of existing resources and the creation of new resources into account within the competitive environment. The ongoing actions and reactions between resources and competitive environment will generate SCA in the market thus to improve the performance in corporations. All the process can be interpreted in the Resource-Based Theory Conceptual Framwork illustrated below:

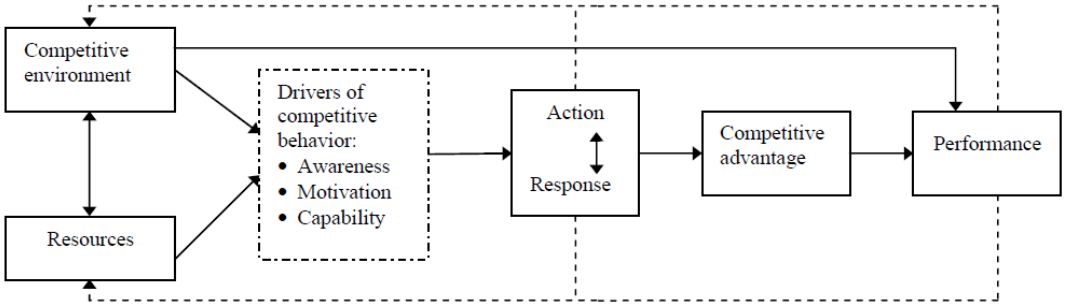


Figure 9 Resource-Based Theory Conceptual Framework[19]

However, Barney admitted that his resource based theory applies to static environment. In today's business reality which is characterized by high velocity and rapid change, his VRIO frame has little potential in application. In many industrial aspects, changing the whole resource base is not realistic in response to the external changes. Meanwhile, ignoring the external change altogether is neither an good option. Thus, 'competitive survival' stated by dynamic capabilities theory is more important

than pursuing ‘competitive advantage’ in resource based theory. In other words, organizational management needs to make full use of their existing resources, and simultaneously understand the ongoing depreciation of this resource base. With this concept in mind, a resource-based theory of strategic alliance concept is carried out in 2000.[20]They integrate the core value that value maximization of an organization through pooling and utilizing valuable resources in resources-based theory, into a form either to obtain others’ resources or retain and develop one’s own resources by combining others’ resources through alliance.

For resource obtaining, it’s getting more and more popular to see multinational corporations entering foreign markets either by acquiring a local company or by forming international joint ventures in order to obtain their needed resources, such as local facilities, knowledge and labor. However, based on resources-based theory, alliance has more advantages over mergers/acquisitions(M&As).[21]Because there is sure to have a certain degree of unwanted assets, either less valuable or redundant, mixed with desired assets in target firms. M&As inevitably absorb the unwanted assets and in their separation process, loss is definitely happens. While through strategic alliance, we can easily get those desired and by pass those non-desired thus to reach overall competitive advantage.

For resource retaining, organizations tend to retain their idle resources in slack time through alliance in order to prevent decaying in know-how, or to keep using these resources to remain their capabilities(remember by doing).In this sense, strategic alliance also has advantage over M&As which is determined by their natural characteristics: alliance only relinquishes resources temporarily and still have the access for future internal deployment, however, M&As relinquishes resources permanently. But this advantages only exists when the PV of the deployment of resources in the future is more than the realized value by selling them right now.

Alliance performance is increased by increasing collective strength of resources and decreasing the internal conflicts. A strategic fit between alliance partners with a shared understanding of business rationale, together with supplementary and complementary alignment, will generate collective strength of alliance resources. Competing interests, incompatible goals, disagreement in resource allocation, may lead to internal conflicts. Internal trust and mutual tolerance is critically important for controlling conflicts in strategic alliance management process.

With those discussed above, we conclude several accessing parameters helping managers to evaluate how well the internal resources are managed for improved performance.

Parameters	Brief description
Valuable	Increase its net revenues or lower its net costs
Rare	Resource uniqueness among competitors
Imperfect imitability	Hard to perfectly imitate or copy
Non-substitutability	Cannot be replaced by alternatives for same effect
Organized to capture the value	Organizational processes, policies, mechanisms and procedures are sufficient to capture the resources SCA
Strategic alliance	Resource sharing and integration through strategic alliance

Table 3 Evaluation Parameters of Resource-Based Theory

2.5 Stakeholder theory

Stakeholder theory is a conceptual framework of business ethics and organizational management which addresses moral and ethical values in the management of a business or other organization [22]. Traditionally, the stakeholders are considered as owners and shareholders in the company. However, in stakeholder theory, it is defined as any group or individual which can affect or is affected by the organization, including suppliers, customers, stockholders, employees, financial institutions, local communities and government. [23]The central idea in stakeholder theory is focusing on the stakeholders, satisfying their interests, treating them well, helps the corporation create value in a number of dimensions and thus benefit the corporation.The relationship between firm and its stakeholder constituents are shown in the figure below:

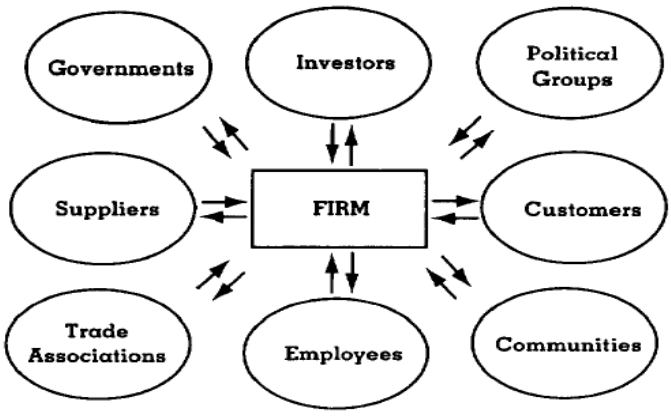


Figure 10 the Stakeholder Model [23]

As a management instrument, the power, legitimacy and urgency in stakeholder theory are used as claims to show a certain stakeholder's importance in organizations.[24]And also organization strategies should meet the needs of diverse groups within its surrounding environment in accordance with their respective importance:

1. Power: the ability to make someone to do something or the power of the stakeholder over the organization.

2. Legitimacy: the widely accepted perception that the organization's action is desirable, appropriate and aligned with the socially constructed context. It can be individual, social or organizational.

3. Urgency: the immediate need of action, which determines the organizational response to the stakeholders' requests. It considers both the time sensitivity (speed of organizational response) and criticality (the importance of request or the relationship between company and stakeholder in detailed problem)

The stakeholder theory can be divided into three approaches: [25] descriptive, instrumental and normative approach respectively:

1. The descriptive: it sets out how the organizational operation goes in terms of stakeholder management. By describing and explaining detailed corporate behaviors and characteristics, to help people understand how managers deals with stakeholders and how the stakeholders represent their interest. Wood suggested [26]that the descriptive theory of stakeholder should also include the organizational reality and the relationships between company and stakeholders.

2. The instrumental: it demonstrates how to attain organizational objectives through stakeholder management. It investigates the consequences of taking stakeholder management by identifying the connections between stakeholders, management and achievement of corporate objectives.Instrumental theory of stakeholder enables organization to personalize relationships with stakeholders, to raise managerial awareness of organizational decisions, processes and policies.

3. The normative: it defines how corporation should operate, especially regarding moral or philosophical principles. It emphasizes that the management effort should be focused on why company needs to satisfy stakeholder and how to achieve this in the perspective of undertaking normative research projects.

The stakeholders are similar to customer, have the power to decide whether or not to engage with a firm and the utility created for stakeholders is dependent on their

behavior performance, which in turn, the amount of utility they receive largely influence whether they will continue to engage in a firm and how they will act in transactions with the firm. Before, the utility is always measured in the term of financial returns. Recently, the utility is not only focused on tangible value, but also the process and distribution of value. According to the Barney [27], there are four factors of perceived utility the stakeholders receive from the firm:

1. Stakeholder utility associated with actual goods and services:

Financial investors provide capital and undertake the risk with uncertainty for the sake of returns from the firm they invest. Employees sacrifice their time, effort, and other resources for the wages and other tangible benefits from the firm. Local communities provide locations, infrastructures and work force in order to obtain benefits such as employment rate in the city, tax revenues and economic growth. What is important to the firm is that they should create the best value possible for the stakeholder, making them perceive that their received utility is enough to guarantee the continued cooperative engagement with firms.

2. Stakeholder utility associated with organizational justice:

People are tend to operate with disciplines of fairness and reciprocation. The organizational justice incorporate three justice as below:

1). Distributional justice: people perceive the received material outcomes from firm as a result of transaction is fair in comparison with the outcomes received by other groups.

2). Procedural justice: the fairness of rules and procedures applied by the firm in decision making process that have connection with other groups.

3). Interactional justice: the equal way in which people treat with each other in regular interactions.

3. Stakeholder utility from affiliation:

People are most likely to work for the firm which is consistent with their value. It is more probably for them to invest their energy, time and attention, to have a strong sense of responsibility, interest and motivation to work when they find themselves belonging to the firm or the feeling of ownership.Utility from affiliation can motivate stakeholders to consider more of the firm’s success, and provide them esteem and satisfaction as well.

4. Stakeholder utility associated with perceived opportunity cost:

The utility associated with opportunity cost is determined by the stakeholders' perception that whether they obtain a good benefit from the organization compared with what if they might get from other similar firms. That is why people like to compare the income or other value in terms of amount with other firms in similar size and scope.

In conclusion, corporations are better able to retain the participation and support from stakeholders when providing more utility to them. Both the firm and other stakeholders determine the stakeholders benefit and interest.

2.6 Triple bottom line theory

Sustainable corporate performance has been a frequently mentioned topic in the past few years. John Elkington started to raise a framework called triple bottom line [28]for measuring corporate sustainability which goes beyond the traditional measures of financial profits, return on investment, and shareholder value to include environmental and social dimensions. By focusing on not only economic welfare(profit),but also society(people)and environment(planet),together with their interactions related to performance, triple bottom line reporting became an important tool to reach sustainability development.

Triple bottom line can be considered as an organizational performance guideline measurement for sustainable development. However, there is no such a universal standard method or access to measure performance in these three perspectives. But on the other hand, this also indicates that it allows a user to adapt the general framework to the needs in different entities, projects or policies, geographic boundaries.

As followed, we will introduce the three dimensions in triple bottom line respectively and also some practical performance indicators:[29]

1. Corporate financial performance:

It is the management's responsibility to increase financial performance as it is closely related to the benefit of stakeholders. It can be measured using three approaches respectively:

1).Market-based approach: the market value of a company is reflected by its stock price. That's why stakeholders are primarily shareholders of the company.

2).Accounting-based approach: It is resulted from a degree to the effectiveness, efficiency and optimal utilization of a company's assets. Such as return on assets (ROA) and return on equity (ROE) in relative terms, and profitability in absolute terms like personal income, cost of under employment, etc.

3).Perceptual-based approach: some corporate financial performance indicators such as ROA, ROE expressed relatively compared to other companies in the way of subjective judgment. For example, multiple accounting-based measures with overall index in the form of score range from 1-5.

2. Corporate environmental performance:

It concerns an organization's impact on natural systems both living and non-living, and reflects potential influences to its viability. Usually, each of the environmental variables is monitored in a long-range trend so that the organizations can give a rather correct and fair judgment on the impacts of a project or policy on the area.

The indicators includes environmental impacts of products and services; energy, water and material consumption; greenhouse and harmful gas emission; solid and toxic waste and recycling, pollution, etc.

3. Corporate social performance:

It concerns the impact of an organization on its social systems such as community region and area. Indicators in labor area includes such as employee health, safety, and gender discrimination; in human rights such as child labor, quality of life; and in social issues such as bribery and corruption, violent crime, community relations, etc.

Triple bottom line is derived from the interference between financial, environmental and social elements as illustrated in the figure below:

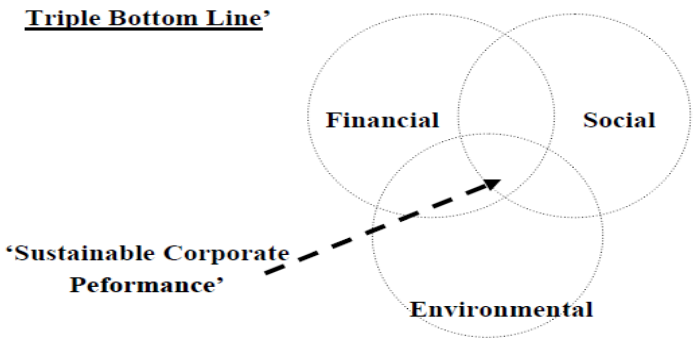


Figure 11 Triple Bottom Line As Sustainable Corporate Performance[30]

In order to evaluate the triple bottom line process, here we carry out a table with several assessing parameters for practical use as below:

Parameters	Brief description
Financial aspect	Concern an organisation's impacts on economic resources of its stakeholders and on economic systems at the local, national, and global levels
Environmental aspect	Concerns an organisation's impact on living and non-living natural systems, including eco-systems, land, air and water
Social aspect	Concern an organisation's impacts on the social systems within which it operates, including labor practices, human rights, and other social issues related to consumers, communities, and other stakeholders

Table 4 Evaluation Parameters of Triple Bottom Line

Triple bottom line as sustainable corporate performance evaluation tool is a relative dynamic and iterative process in which monitoring needs to be performed, adjusted and adapt to the changes in measurement content over time in the market and society, helping management to reach a sustainable improvement in performance.

2.7 Performance improvement methods

When we come to operational process, there are several critical performance management categories: logistics, production engineering, quality, and other areas. Logistics refers to efficient and effective planning and storage of raw materials, inventory, finished goods and services, which is the fundamental step in operation ensuring materials and information being provided at the time of service delivery. It covers not only procurement and production process, but also distribution and disposal process. How to make just-in-time delivery with supply chain by leveraging constrain factors such as scope, time, and budget is the main task in logistics.

Production is the process where raw materials (input) are transferred into desired products and services (output) by adding economic value to them. It can be divided into three categories according to the technique involved: production by separation such as extraction in oil and gas industry; production by modification or improvement like annealing process in mechanic industry and production by assembly, for instance automobile manufacturing and computer production industry. The profit is realized through value-added products and services delivered to customers and market. How to set up effective and efficient manufacturing line with sufficient support, how to keep healthy and continuous association with customer and market change is the main topic in this area.

Quality is closely connected to customer experience, satisfaction and loyalty. Good quality management can help organization to design and produce the desired products and services customer needs, ensuring productivity and profit increase. Meanwhile, quality control can also helps to reduce waste and inventory, strengthen cooperation and coordination between team members within the organization. Improving quality in terms of products, process and service by leveraging cost, profit and other concerns such as environmental and social impact is the main issues to be considered.

Other aspects such as human behavior and factors, cultural and social impact, decision support and continuous improvement also influence organizational performance to a certain extend.

As shown below in the table, we list some performance improvement methods respectively in the categories discussed above for reference in practical operations. But according to the market situation and popular problems identified in operational process in multinational corporations, we will go further to discuss some popular methods such as Just-in-Time (JIT) as a logistics approach, Total Productive Maintenance (TPM) as a resource utilization approach, Total Quality Management (TQM) as a quality approach and Business Process Re-Engineering (BPR) as a process approach in detail.

Logistics	Just in time(JIT) [31] Supply chain management(SCM)[32] Theory of constraints(TOC) [33]
Production Engineering	Total productive maintenance(TPM) Lean production [31] Demand flow technology(DFT) [34] Read a plant fast [35] Simulation Process mapping Single minute exchange of die(SMED) [36] Five S [37]
Quality	Total quality management(TQM) [38] Business process improvement(BPI) [39] Six sigma [40]
Other	Decision support Human factors and ergonomics [41] Continuous improvement[42]

Table 5 Performance improvement methods

- **Just in time(JIT)**

As a logistic approach, Just in time (JIT) is focus on an ideal stockless production process by reducing waste and throughput-time.[31]The core idea in this method is to reduce work-in-process and inventory levels, in turn to reveal problems in operational process. Just like the figure Japanese sea shows below, underwater rocks (problems) will be seen in lower-level water.

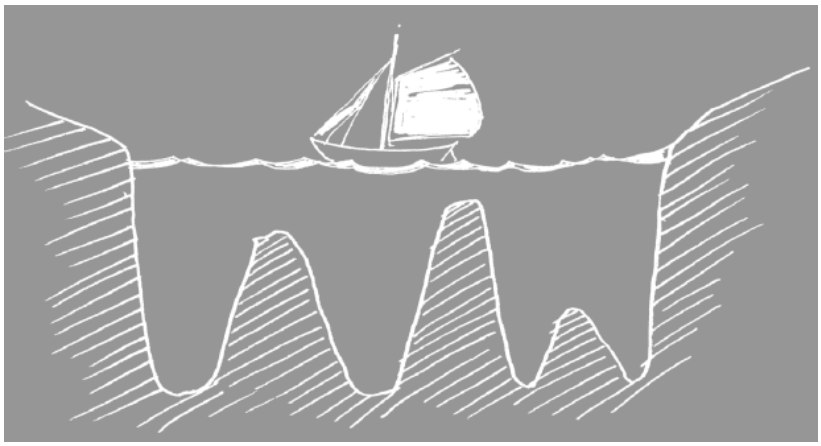


Figure 12 Japanese Sea [43]

Just in time bases its theory on four points: scheduling, control, planning and layout principles respectively:

1. Scheduling principles: reduced lots. Contrary to traditional push production methods, Just in time adopts pull scheduling with small lots in flow, tightly linked to the customer demand.
2. Control principles: Kanban system[44]. Developed by Toyota, Kanban starts with customer needs and follow the downstream production, ensuring that the inventory is based on customer orders rather than managerial forecast.
3. Planning principles: reduced inventories. Since all the requests on the Kanban card to trigger following production are pulled from the customer order, the excess inventory can be eliminated, as well as related inventory cost and space.
4. Layout principles: flow oriented layout. Because Kanban system in Just in time is the leveling of production. To be able to implement JIT in practice, quick changeover, and highly trained staff and also flow oriented layout is required.

The implementation of JIT is time and resource demanding. It does not only need top management commitment, but also all employees' effort to balance and react to the customer needs and demand. Expert assistance is also critical in the implementation process of JIT.JIT does not mean that it is zero inventory production

in manufacturing process, since they also need buffers to compensate for system failures. But level of inventory amount in these buffers should be evaluated according to specific situations, and be balanced with cost and time, neither too high nor too low. Measurements, such as inventory turnaround, work-in-progress, lead times and changeovers, can be used to support JIT.

- **Total productive maintenance(TPM)**

From the perspective of production engineering, Total productive maintenance(TPM) is an approach to stabilize utilization of machine resources by reducing waste.[45]TPM starts with a pilot project, which attracts the organizational management's attention on the possible results it would result in, and monitors machine/equipment by OEE(overall equipment efficiency) to visualize the utilization losses. The equipment losses are classified into four hierarchical levels as below. When the losses are eliminated from one level, it will goes to the next level.

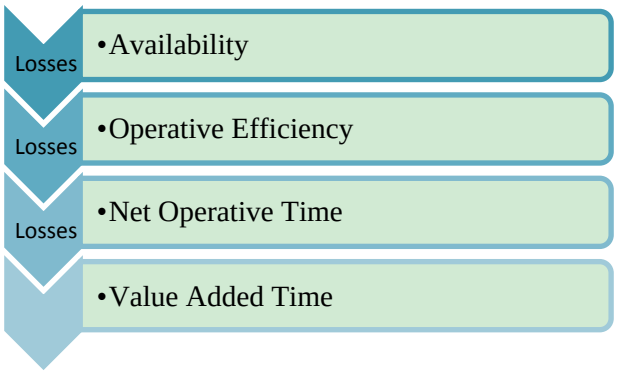


Figure 13 Model of TPM[46]

For example, Availability-Losses=Operative Efficiency. In the first level, the losses including machine failures, set-ups and equipment shifts. In the second level, the losses consist of idle running, stops, bottlenecks and speed losses. In the third level, the losses relates to quality issues. And the final goal for TPM is to make availability time and value adding time as close as possible.

The implementation process of TPM suggested by Ljungberg[47] includes 7 steps as follows:

1. Cleaning of equipment and work zone.
2. Identify and target causes of dirtying.
3. Make standards and checklists for cleaning.
4. Inspection and monitoring education.
5. Make standards and checklist for inspection and monitoring.

6. Work zone arrangement and preparation.
7. Maintenance work by operators autonomously.

Total productive maintenance should be carried out from day-to-day and be implemented both in production and technical departments.TPM is a resource and competence demanding process, and it requires the operator to be educated or trained in order to run TPM in an autonomous way, reducing the cost of consultants and specialists. But in initial part, since it resource and time demanding characteristics, consults and specialists are necessary. Also since it incorporates production and maintenance departments, risk of conflicts between them should be considered in advance. At last, it is a time consuming method, sometimes a five or ten-year implementation scheme is possible. But it will provide a strong support in measurement, about which object to improve and how to implement in practice.

- **Total quality management(TQM)**

Meeting and satisfying customer and stakeholder needs and expectations is the ultimate aim of organization performance management. And there should be continuous sake for the quality of products and service delivered to the customers. Total quality management is [38]such a tool that make organization-wide efforts to install and make a permanent climate in which an organization continuously improves its ability to deliver high-quality products and services to customers. It is a joint and continuous effort that focusing on the control of business and customer satisfaction by everyone involved with an organization to understand, meet, and to exceed the performance expectations. It’s a comprehensive concept which including improvement, statistic control, supply control and quality engineering rather than the simple product or service quality in common sense.

There are 6 core principles [48]of total quality management:

1. Understanding and fulfilling the needs of customers:

It’s the responsibilities for everyone involved in the organization to have a better understanding and make efforts to fulfill the needs of customers. There are 3 levels of quality as bellows:

1).Must quality: the basic requirements of the product or service.
2).Expected quality: the requirements that the customer assume will be met.
3).Excitement quality: those exceed the requirements and attract customers.

On the basis of satisfying the must quality requirements, the organization should

make efforts to meet expected and even excitement quality requirements as possible by listening the voice of the customers directly.

2. Leadership of total quality is by management:

Leadership of an organization, especially the upper management, compared to the middle of lower management, is more responsible to set goals, develop strategies, and provide the means to achieve the total quality, especially more weight on setting strategic directions and leading breakthroughs in performance.

3. Data-based statistical reasoning for decision making:

Many company lack of adequate methods to make and support decisions. In order to make the right decision with sufficient support, we should use some of the analytical and statistical techniques for quality improvement such as Flow chart, Pareto chart, Fishbone diagrams, Quality evolution charts, Histograms and Control chart.

4. Focus is on continual improvement of business process:

Inspections and detection of errors achieves a higher quality but at a much higher cost compared to the continual improvement process of total quality-D-C-A cycle is a systematic, scientific method for continual improvement which consists of plan, do, check and action. The majority of time and energy is spent in the plan phase which analyzing the current situation of organization, customer and competitors. Possible quality improvement options and basic tools are analyzed in this step thus set a basis for the total quality improvement. Do is a trial step of collecting data in the process of implementing process which will be needed in next phase. Check is the phase of check the deviation between the original plan and its execution results in order to make improvement. And at last Action is the operating process. The continual turning of the P-D-C-A wheel forms the scientific approach to continual improvement.

5. Problem solving and process improvement by multifunction teams:

Multifunction teams have more mutual respect and support coming from cooperation for the common goal besides the basic education, training, skills and knowledge which will be more qualified for the complex situation.

6. Continual learning and training:

The continual learning, training and application of quality principles and techniques will expand the capabilities of organization people and functions which in turn will benefit of integrated total quality.

An interesting part of TQM is that there are many awards provided by different foundations, like European Foundation of Quality Management (EFQM), Deming Price and Malcolm Baldridge. These prizes are intended to increase the awareness of quality management in organizations, and to stimulate their self-awareness and self-analysis.

EFQM excellence model is a non-prescriptive framework to assess an organization's progress toward excellence, consisting of 9 criteria for sustained performance excellence, using a self-assessment strategy for improving performance. Excellent results with in terms of performance, customers, people, and society are achieved through leadership driving policy and strategy, which is delivered through people, partnerships, and resources and processes shown as below:

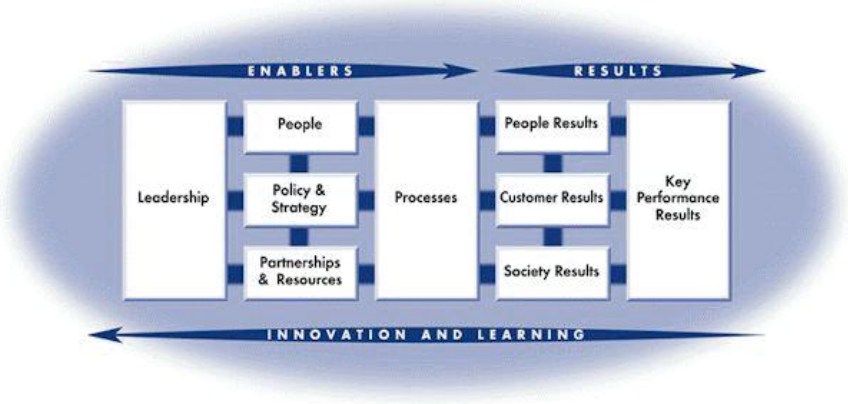


Figure 14 the EFQM Excellence Model [49]

The enablers are used as performance factors for improvement, and results are the possible areas where results should be shown if the enablers are used properly. Innovation and learning as a Kaizen approach can be obtained by benchmarking. After evaluation of these criteria, the problem can be diagnosed and analyzed.

An improvement method is used in EFQM called RADAR[50]:

1. Results: What are we trying to achieve.
2. Approaches: How do we try to achieve this, the enablers in Figure 14 are related.
3. Deployment: How / where / when was this implemented?
4. Assessment and Review: How do we measure whether it is working and check what methods have been used and whether they have been deployed to the right extent.

With the evaluation approach provided by EFQM, what to be improved can be identified during the process of quality management, which in turn reduce the resistance from organization.TQM gives competence, and combined with benchmarking, the organizational quality management can be accomplished. However since TQM is such an extensive method, consultant and specialist help is necessary in practice.

- **Business Process Re-Engineering(BPR)**

Instability and intensive competition in business environment has become the new condition in market due to the globalization of the economy and liberalization of the trade market. Competition is increasing in terms of quality, price, service, and delivery. Removal of barriers, international corporation, and innovations in technology intensifies this competition more. It is becoming more and more necessary for organization transformation within the entire processes, within organization climate, and with organization structure.

In 1993,Hammer and Champy proposed a concept called business process re-engineering, which refers to the fundamental rethinking and radical redesign of the process in business to reach dramatic improvements in important, contemporary factors of performance, for example factors like quality, cost, speed and service.[51] Business process re-engineering emphasizes a holistic focus on business objectives and how processes related to them, encouraging full-scale recreation of processes rather than optimization of sub processes in order to improve customer service, cut operational cost and time, therefore becoming the world-leading competitors.

First let’s take a look at one typical case to see how BPR transform the organizational business process. In the past, when a customer goes to bank apply for a loan, ATM card and set up a new saving account, he has to go to three different desks to get services. But with the advancement of information technology, BPR becomes possible to transform this process into a One Stop mode where a case manager may ask the customer about his needs and triggers three processes simultaneously within their internal business structure. Related customer information and data are delivered in electronic forms to be accessed and approved by different departments. The customer’s request will be satisfied at the same time with parallel actions without moving from one desk to another for signatures and documents.

This is actually the transformation from vertical structure to cross functional structure based on processes. By braking the departmental barriers, different departments cooperate together through designed process to service the customer.BPR

is focused on team operations around processes to provide customer-oriented effective and efficient organizations.

In order to set up this customer-oriented operation process, it needs to redraw organizational boundaries, reconsider of job, task, skill allocation, re-architect the business and management processes with advancement of technology. In 1990, with telecommunication technologies revolution, it is becoming more and more popular and affordable to upgrade business process with intranets, extranets, workflow and groupware applications. Working together with long distance is no longer a dream. In the following, we will see how to apply BPR into an organization.

1. Empowering people.

In order to make the working mechanism more effective and efficient, sufficient and right information, tools, training, environment and authorities are necessary. Information system makes information, tools and training accessible to people.

1) Providing information

Information system provides people with necessary information to aid in their work. Some information is for instant essential needs, for example the prices of raw materials to calculate procurement cost in supply chain. Some information are stored for long-term potential use, for example medical history information for different doctors to review in various ways.

2) Providing tool

Information system works as a efficient tool for analysts in their daily life. Take raw material procurement process for example, cost of raw material procurement depends on the sum of cost of all types of materials. If the price of material changes during a negotiation process, then all data has to be recalculated with paper work. Information system with consistent, accurate recording and calculation function makes it more efficient, leaving more time and energy for analysts to focus on more productive work such as quality control.

3) Providing training

Some information systems are designed with information to guide, support daily operations, which can be used for training and learning purpose. Especially for multinational corporations, mutual disciplines, regulations, standards are easy to publish and share for subsidiaries all over the world to save time and budget.

2. Eliminating unproductive uses of time.

There are studies show that many professionals and experts spent less than half of their working time on activities directly resulting in their functions.BPR with information system can save much of their unproductive time in repeated activities such as collecting price and product information, tracking customer order status, reporting of time and expenses.

3. Eliminating variations in procedures and systems

For multinational corporations, separate subsidiaries use different procedures and systems to conduct similar operations such as salary payment, supply procurement, inventory tracking. These procedures and systems seem sufficient for local use in subsidiaries, but in the point of global view, it is always far from efficient. For example, when new technologies, regulations and business issues launched, each separate system and procedures need to be considered respectively from the starting point, which costs a lot of time and budget.

4. Minimizing the burden of data recording

Data recording is involved in every procedure in operational process, improving data recording efficiency by information system is very important to increase processing efficiency. There are two principles in data recording:

1) Following six components of data process: in order to be efficient and effective, try to record data briefly according to six components, which are data capturing, transmitting, storing, retrieving, manipulating and displaying.

2) Conduct data capturing and data generation simultaneously, avoid repeated work to minimize the burden of data recording.

In a summary, BPR's organizational changes are based on the combination of rapid change of methodology, employee empowerment and information system support. To fully implement BPR in an organization, these actions following are always necessary:

1. Select a value-added process for redesign.
2. Simplify the process by minimizing unproductive steps for efficiency optimization.
3. Set up process teams consisting of a coordinator and employees for each process.
4. Smooth workflow with document and data transfer and control.
5. Allocate proper responsibilities and roles for each process.
6. Process automation by information system including intranets,extranets and

workflow management.

7. Conduct process teams training about how to efficiently manage and operate in new processes.

8. Embed the newly redesigned processes into business organizational structure

9. Monitor the new process to see if the goal is reached and make necessary corrections.

To be briefly, the core value in BPR can be concluded as three Rs: redesign, retool and re-orchestrate shown in table below:

Redesign	**Retool**	**Re-orchestrate**
Simplify	Networks	Synchronize Process
Standardize	Intranets	Synchronize IT
Empowering	Extranets	Synchronize Human Resource
Employee ship	Workflow	
Groupware		
Measurement		

Table 6 The three Rs of re-engineering[51]

Apply BPR into organizations to transform traditional structure into network type structure involves a lot of changes in terms of structure, processes, people and technology. The figure below compares the differences when BPR is implemented in organizations.

From conventional	**To BPR**
Functional departments	Process Teams
Simple tasks (division of labor)	Empowered employees
Controlled people (by management)	Multidimensional work
Training of employees	Education of employees
Compensation for skill and time spent	Compensation for results
Pay raises based on promotions and seniority	Low pay plus high performance-related bonuses
Advancement based on ability	Advancement based on performance
Protective organizational culture	Productive organizational structure
Managers supervise and control	Managers coach and advise
Hierarchical organizational structure	Horizontal (flat) structure
Executives as scorekeepers	Executives as leaders
Separation of duties and functions	Cross-functional teams
Linear and sequential processes	Parallel process
Mass production	Mass customization

Table 7 Changes under BPR [51]

All above are three typical performance improvement methods, and other methods mentioned in Table 5 are also useful depending on detailed situation. Decision makers should choose appropriate method flexibly.

Chapter 3 Case studies

This chapter is a review of related case studies in four multinational corporations where different performance improvement theories and methods are implied. The four case studies are: Toyota as a manufacturing company in automobile industry which is famous for its disseminated TPS(Toyota Production System) and learning organization; Capsugel, also as a manufacturing company, in pharmaceutical industry which has succeeded in quality control with Six Sigma theory; Mcdonald's, a servicing company in QSR(quick service restaurant) industry, has their special knowledge management system; and Shell, at last, a combination of manufacturing and service company in oil and gas industry, years of endeavors in stakeholder theory and TBL(Triple Bottom Line),help it get through many industrial crisis thus build its worldwide reputation.

Figure 15 Case Study Organizational Logo

By within case analysis and cross case analysis, we will have a deeper understanding of how those literature theories and methods have been successfully applied to improve multinational corporations' performance. Besides, the case studies also shed light on research results and recommendations in later chapters.

3.1 Toyota case study

As we all know, Toyota is a world leading Japanese automotive manufacturer, with headquarter located in Toyota, Aichi, Japan. Toyota motor multinational corporation has over 338000 employees all over the world by the year of 2014, with its subsidiaries spread worldwide as well [52].Toyota was the biggest automobile manufacturer in 2012, followed by G.M. and Volkswagen Group. And in 2014, Toyota was been ranking in the twelfth position among the world largest company list by revenue. In 2012, the vehicle production of Toyota has exceeded 200 million, and it is the first car manufacturer to have production over 10 million per year [53].

Since its foundation in 1937 by Kiichiro Toyoda, Toyota strived to contribute to sustainable development in society and earth by providing high-quality and innovative products and services and has reached revenue of ¥25.691 trillion in 2014.They successfully implement Toyota Production System(TPS), Innovation and Learning organization and knowledge management theory in their performance management process and pass down these corporate philosophy, methods and values from generation to generation and spread all over the world. In the following, we will take a detailed look at how they implement these three theories and methods in practice.

3.1.1 Toyota production system

Toyota Production System is developed by Toyota Motor Corporation aiming at best quality, lowest cost and shortest lead time by elimination of waste. It consists of two main parts: Just-In-Time and Jidoka, acting as two pillars as shown in the figure below.TPS is realized and maintained through rotation of Heijunka, standardized work and Kaizen, following the scientific method plan-do-check and act (PDCA).

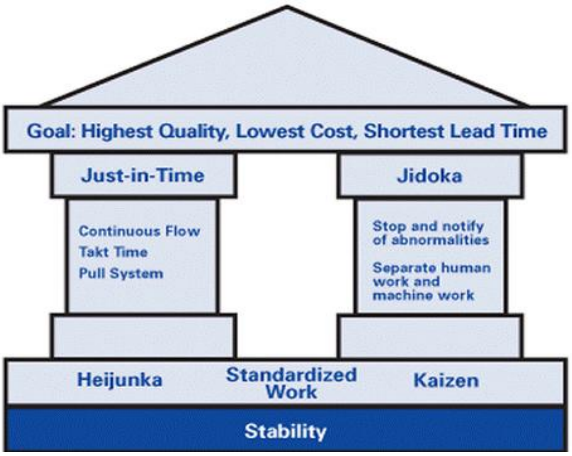


Figure 16 Toyota Production System[54]

- **Just-In-Time:**

Toyota Production System satisfies customer demand effectively by connecting all production activities to the real market demand. Just-In-Time production only produces what is needed, when it is needed and the quantities needed. They produce quality products efficiently without waste, inconsistency, and inappropriate requirements in production process. The detailed production process[55] is illustrated as following:

1. The production instruction is issued at the start point in vehicle production line once the customer order is received.

2. The assembly line has required amount and types of needed parts in stock to make sure that the ordered type of vehicle can be assembled.

3. Preceding process: once the parts in stock have been used in production, the same amount of parts must be retrieved from the part-producing process for replacement.

4. Try to keep small amount of parts of all types in stock to minimize spare part management cost and ensure their quality. Produce only the amount and type of parts that were used in next down-flow production stream.

This smooth, continuous and optimized workflow is realized and controlled by four steps[56] as following:

1. Heijunka:

As a key element in Just-in-time process, Heijunka aims at eliminating workload unevenness (mura) by leveling the volumes to ensure efficient and cost-effective flow. It is opposite to mass production, where high quantities of a single product are produced, often leads to unnecessary inventory costs and unrelated to demand.

With the help of Heijunka, the production process can switch to products easily, depending on what is needed, how much is needed and when it is needed. Any volume variations are adjusted though a level-average demand rate.

The implementation of Heijunka also reduces over workload or overburden (muri) which may results in safety and quality problems. Both mura and muri are included in the area of waste (muda),which should be avoided in production.

2. Elimination of muda:

Muda, which is considered as waste, or anything that doesn’t add value to product. Some aspects such as overproduction, too much inventory, rework, and repeated movement, processing and waiting are always neglected, but cost a lot in production process.

3. Takt time:

Production time management is critical in Toyota Production System according to the demand rate from customer (takt). Takt time is the work cycle duration that satisfies every customer’s demand.

The work-cycle should works at the same pace with market demand, neither overproduction nor underproduction. Takt time directly determines the flow rate and decides how much work can be finished. Takt time optimization can help to reduce

waste and increase efficiency by eliminating delays and overproduction.

Heijunka and Takt time work together, enabling Toyota to adjust production flexibly according to the market demand, ensuring smooth and proportionate production process.

4. Kanban card:

Kanban card is a simple, visible device used in Toyota Production System to call for components when they are needed, which means that only minimum quantity of components is stocked at assembly line to ensure cost-efficiency. A kanban card instruction is always from an operator point to make sure that components are delivered just-in-time (right things in right place at right time according to customer demand).Instead of push principle, kanban card is designed and used based on pull principle, closely connected to items' demand.

- **Jidoka:**

Quality control is very strict in Toyota, without any room for compromise. Jidoka includes quality control in every production steps to ensure their visibility. Any abnormalities can be immediately detected by Jidoka.

Jidoka is known as automation with a human touch, which means that the product quality is monitored and checked by each production operator in the goods-in-process until next downstream production line. The whole production system will stop temporarily if any defect is detected for revision.

Jidoka's quality assurance function is realized through four main stages[57] as following:

1. Genchi genbutsu: going to the source.

Quality Improvement can only be realized on the basis of problems discoveries.

In order to have a complete and deep understanding of the problem, it's better to go through Genchi genbutsu, which is going to the source or root of the problem by yourself rather than the information provided by others. Direct sense always makes accuracy.

2. Andon board:

Andon board is a simple and visible electronic board showing the status of different process in production line. It will give management a clear warning immediately with its accurate location if any problems are detected by operator. The

operator has the right to stop production line if necessary and be responsible for the quality in his control area. The production line will only be restarted unless the root or source of fault has been resolved.

3. Standardization:

It is also necessary to keep standardization for quality assurance. Standardized production procedure and criterion not only makes sure of high level quality production, but also helps to measure production rate and provides a benchmark for continuous quality improvement.

4. Mistake-proofing and labeling:

Special devices and equipments always confuse front-line workers, resulting in many typical errors in their work. In Toyota, they have a principle called poka-yoke, according to which, all frequently used items and devices are clearly labeled with its function, name, use instructions, location, etc, in the form of description or bar code, so that they can be easily found and properly used by everyone.

Quality maintenance by Jidoka helps to build up Toyota's quality reputation through all staff' effort from quality check, problems detect and fix, until its product delivery to the customer. High quality products provided by Toyota benefits customer not only at the sales point, but also in its usage period with less downtime, and more safe, convenient experience.

3.1.2 Toyota innovation

As to innovation theory implementation in Toyota, or whether Toyota is an innovative organization, it comes to the way of how we define innovation. If we put emphasis on products, or technical innovation we mentioned in Chapter 2.1,of course, Toyota succeeded in product innovation to some extend. The first hybrid car(Prius) was produced by Toyota, and its other environmentally products such as electric, plug-in hybrid and fuel cell series, as well as its safety technology etc. But the truth is that these new energy car and technology only contributes to a small percentage of Toyota's sales,and other automobile manufacturer also invest in these areas as well. So what innovation makes Toyota to become such a leading company in automobile industry?

As we discussed in Chapter 2.1, administrative innovation, including innovation within staff, market and organizational structure and climate is of great importance to Toyota's success. Administrative innovation enable a company to have the inherent

ability to not just innovate with occasional flash of brilliance, but also to innovate continuously, which is a rather important strategic advantage over other strong rivals in the fast-moving market. Toyota has been endeavored in both philosophy and process innovation management [58]as follows in last few decades:

1. Management's view on profit and innovation:

Profit: Just like 14 Principles of Toyota Way, the fist principle is "Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals". Toyota takes long-term profit attitude rather than short-term benefit,and their costly recall in 2009 perfectly proved this.

Innovation: Top leadership, including Sakichi Toyoda, Kiishiro Toyoda, and subsequent leaders, has great passionate and emphasis on continuous innovation. "Stay ahead of the times by study and creativity" is one of their slogan. In 2013, Toyota reinvested $9.1 billion in research and development, as 3.5% of their revenue.

Both their profit and innovation attitude in leadership laid the solid foundation for organizational innovation, and passed down from generation to generation.

2. Information and communication.

Toyota has been endeavored to maintain an information flow to ease communication within the organization worldwide. According to Toyota Way, Toyota adapts a relatively decentralized flat organization to ease communication, but also encourage team work in which problems can be solved internally. It enables both directions for information flow.

Toyota also claims to build open and transparent information mechanism, to have a close connect with its partners at all levels including its full range of stakeholders such as suppliers, customers, etc. Both technical and management information can be shared, even bad news are seldom kept from employees. The information availability and communication smooth give possible space for innovative ideas exchange, creation and implementation.

3. Innovative culture:

Employee and customer involvement: according to Toyota Way, principle 13, " Make decisions slowly by consensus, thoroughly considering all options; implement decisions rapidly". Toyota tries to reach consensus with information and ideas obtained from customer and employee which enabling its innovation diversity and reliability.

Availability of reward mechanism for innovation: innovation is encouraged by giving bonuses to team work, equally to all team members based on Toyota's idea of sharing benefits and teamwork. Promotion is also dependent on individual's long-term career performance, focusing on employee's life-long contribution. It may be a little different to western reward system which put more emphasis on individual, but under transparent mechanism, still widely accepted by participants and have strong motivation for innovation.

4. Innovative process and system:

Many manufacturing and service process incorporate the ideas of sustainable development. For example, Andon board enables operator to stop the production line for problem revision and solution. Besides, the concept of Kaizen, which means continuously improve, has been implied into innovation process. Toyota reinvests itself every 10 year through short and steady improvement in process, showing sustainable innovation power than other companies who focus on radical change in product more or less continuously.

5. Self-managed teams with trust for long term development.

Toyota expects employees who are completely loyal to company and reward them with life-long employment. A steady working environment enables employees to settle down focusing on work contribution and reduces cost and risk related to recruitment for company.

With this long-term connection between company and employee, trust is easy to build,making innovation teamwork more flexible and self-manageable, which encourages more creation and innovation.

3.1.3 Toyota learning organization

Toyota can be praised as an organization which implies learning organization theory in depth to its culture. No matter factory floor or execution office, learning can be obviously noticed. The foundation of this is the Toyota Way written by Jeffrey Liker, the 14th principle of which stating that: "Become a learning organization through relentless reflection and continuous improvement" .When considering why Toyota has succeeded in learning organization process, there are three reasons [59]that can be concluded:

1. Analyse root causes and develop related solutions.

It's important to have reflection mechanism so that the feedback information is

set in an organization's knowledge base. As a tool, Toyota analyses problems or defects through Genchi genbutsu to identify the root causes and conclude experience .A five whys method is popular within the organization shown as follows:

Problem levels	**Related solutions**
A pool of oil is found on the floor.	Clean up it.
Because the machine is found leaking oil.	Fix the machine.
Because the gasket has been worn out.	Replace the gasket.
Because the gasket material is not good.	Change the gasket specification.
Because the gasket is of economic price.	Change the procurement policy.
Because the procurement agent evaluated the product on short-term benefit.	Change the procurement agent's evaluation policy.

Table 8 Toyota Root Cause Analysis and Solutions.[60]

2. Hansei: usually "introspection" or "reflection" and organization learning.

In Japanese culture, Han means "change", "to turn something over", "to see something from a different perspective", and Sei means "to review", "to examine yourself". Performance improvement is realized through continuous reflection of weakness and making corresponding solutions. Toyota embeds Hansei into its products and process, improving from feedback and revisions.

3. Solid policy deployment through Hoshin kanri.

Hoshin kanri is a method which captures and cements strategic goals as well as flashes of insight about the future and develops the solutions to bring these into reality.[61]Toyota uses a cascading structure to build up its organizational goals from top to bottom. All the levels support it through measurable and concrete execution to make sure that every deployment step is monitored with measurement.

Toyota implements Toyota Way of learning organization throughout the whole organization for more than a decade. New managers are trained with Toyota Way on manufacturing floor; Experienced engineers are hired back to give these managers instructions on a regularly schedule; Senior management levels come among the front-line workers to tell them Toyota history and pass down core values; Senior manager are responsible for root cause analysis and solution finding work; All the employees, new hires, and manager taking care of the product quality with the help of experts. Education institute such as Toyota Technological institute and Chicago branch campus provide systematic education for technical staff. The concept of continuous performance improvement through organizational learning is formed,

developed and matured by all these training, action-learning, coaching, mentoring and systematic education process which made the foundation of Toyota's success today.

3.2 Capsugel case study

Capsugel is a global leading multinational corporation in delivering high-quality, innovative dosage forms and solutions to its customers in pharmaceutical and health and nutrition industry. This pharmaceutical manufacturer produces and sells drug capsules, equipment for filling empty and liquid capsules, as well as equipment for sealing liquid capsules. Its Hard Capsule business provides customers with its diverse types of capsule technologies such as gelatin, liquid-filled and vegetarian, etc. Through continuous technology and manufacturing capability development, Capsugel's Dosage Form Solutions successfully solve many critical challenges for its customers, such as bioavailability enhancement, abuse deterrence, modified release, inhalation formulation and biotherapeutic processing. They adopted fast-to-clinic production flow line to produce products from pre-formulation with concerns of clinical and commercial supply for the completed dosage forms. Since its foundation in 1931 in Detroit, Michigan as a a division of Parke-Davis,Capsugel has been through several mergers and acquisitions. Until now, Capsugel has developed into a world-class pharmaceutical corporation serving more than 4000 customers in more than 100 countries. All these success of Capsugel can be resulted from their perfect implementation of quality management through Six Sigma and Quality by Design theory and related cost-efficiency improvement and measurement methods. And in the following discussion, we will take a deep look into these two aspects in Capsugel.

3.2.1 Capsule quality management

- **Six Sigma theory**

Capsulgel successfully applied Six Sigma theory[62] into their drug manufacturing process in 2006,and increased its products' quality and ultimately reached a balance between implementation cost and potential savings and opportunities. Now we will discover how they integrate their manufacturing system with this theory in practice:

1. Training sessions, Six Sigma steering committee to allocate projects and select Black Belt candidates.

Any successful Six Sigma project with a world wide scale requires strong top-bottom management support and all staff's bottom-up contribution and

involvement. Thus a training program is necessary to spread this quality improvement theory within its organization.

Instead of creating a new organization structure for Six Sigma theory work, Capsugel integrated its existing structure with some training sessions, committee for its implementation.

According to Blair Chalmers, the global Six Sigma manager in Capsugel, "we didn't take additional overhead for large groups of Black Belts' training." They set up some week-long training sessions for key engineers, and combine a month-term project for practical experience. Black Belt workforce get are taught with theory in training session, and gain experience by working on solving major, chronic problems in projects. Once they graduated from this with training certification, they will move to other projects and next generation of training rotation starts.

Capsugel also set up its Quality Summit, an annual meeting held in headquarters with attendance of regional general managers, sales managers, plant managers, quality assurance managers from all its subsidiaries and regions. Besides, leaders from research and development department and global operation will also attend. They get together to discuss issues such as performance review, customer satisfaction, and Six Sigma initiatives and future project development directions.

Capsugel also established a Six Sigma steering committee which aiming at continuous quality improvement discussion with concerns to each region and subsidiaries. They will allocate projects to regional teams through analysis by using methodologies such Pareto Analysis and Voice of Customer (VOC) data, etc. Then each team will break down project work into detail by using the same Six Sigma theory following DMAIC (Define, Measure, Analyze, Improve and Control) process.

Capsugel select some Black Belts to be responsible of regional Six Sigma implementation. All Black Belts candidates are evaluated through strict requirement factors listed below:

1) They must have strong leadership and ability to mentor and cooperate with others.
2) They must be technical experts among the team members to solve practical problems.
3) They should respect others' knowledge and expertise.

Once they are selected, they will spend their time on ensuring consistent application of Six Sigma across various functions and departments in his region. They are guided by global Six Sigma steering committee with top leadership management

support, and responsible for quality assurance and culture, mindset spreading with dedication from team members such as Green Belts and Yellow Belts graduated from training and assignment. This innovative top-down and bottom-up structure in Capsugel promotes regional collaboration, and has a good effect on Six Sigma implementation in subsidiaries with better quality outcomes. For example, one facility was stuck by one process issue for many years without solution even through a series of statistical analysis and theories investigation. But collaboration between newly trained Black Belts applying Six Sigma tools identified the root cause in a short time and quality improvement was finally reached.

2. Tools and data helps Six Sigma adopted globally and locally.

Six Sigma methodologies give a deep root cause analysis through data obtained by team members' dedication. A set of tools are accessible in each step of DMAIC cycle to ensure its effectiveness in practice. For example, an integral tool called DOE(design of experiment) in process improvements at Capsugel's Colmar, France, helps to analyze the multiple impacts of influencing factors in complex situations. Compared to statistical analysis,it can give powerful and insightful data in interactions between variables, providing the root cause analysis rather than looking at the symptoms.

By applying Six Sigma theory in global market, Capsugels obtains synergies among local experience and conclude more mileage in quality improvements on a global scale. On the other side, Six Sigma implementations in different local regions can also give some similarities and special differences that can be valued as a theory base for global standard.

3. Results from Six Sigma implementation in business.

Capsugel's Six Sigma implementation gives quick, excellent payback without any extra overhead on structure rebuilding. Review report showed that improvement in imprinting machine has a 88% reduction in missing capsules during loading; a 50% cycle time reduction for gelatin feed tanks and a 50% waste reduction with overall productivity improvement.

The outcomes of Capsugel Six Sigma implementation have greatly exceeded their management's expectations, not only shown by statistical report in performance, but also with its corresponded deep analysis and root causes through new way of thinking. It helps to accelerate its product delivery and improve its product quality to market and customers.

- **Quality by Design and a right combination of formulation, equipment and capsule**

A good productivity result can be achieved by complete thinking and planning ahead of early set up stages. The quality of product can be insured by a set of optimal circumstances which avoids problems in the process from manufacturing until market. The famous concept, Quality by Design is first pioneered by Joseph M. Juran, stating that quality can be planned and the encountered problems are related to how the quality was planned from the beginning [63].

To apply Quality by Design into capsule-filling efficiency improvement, matching various dosing options, styles and capsule-filling technologies of the capsule filter to the characteristics of products is primary and foremost. Each style has its advantages and limitations. A right combination of formulation, filling equipment and capsule can lead to improvement in manufacturing efficiency and profitability. Having a deep understanding of different types of dosing options, and making a good match between dosing option and powder characteristics, can help to prevent potential pitfalls in the future.

A typical case for example is the bitter taste case. Consumers complained about the bitter taste capsule to a manufacture. Capsugel analyzed the manufacturing process, found that a sticky and gritty powder was not adequately compacted by the machine for dosing. The capsules were filled beyond the capacity in order to make sure of the desired weight. The poorly jointed slugs and undersized capsules led to the powder loss into the segment which interfered with closing and the left powder on the surface resulting in the bitter taste. Capsugel Technical Service Engineers improved the compaction, adjusted the equipment to produce a better slug, which in turn powder losses were drastically reduced. With this revision, the manufacturer saved annual volume close to 1 million with less powder lossless downtime for cleaning, increased equipment speed and dramatically dropped consumer complaints.

3.2.2 Capsugel’s cost-efficiency improvement and measurement methods

The fundamental rules have changed for product and production development in pharmaceutical and health industries.

First, due to the growing needs of the new and emerging patient populations, many pharmaceutical companies launched their new production workflow; there is an emergency need for them to keep their production ability to meet the demands in manufacturing. [64]Secondly, with the escalating industry in health and nutrition, the

number of consumers with direct approach to health care is expanding so rapidly, the demand of speed-to-market is urgent. Thirdly, cost-effectiveness and improved performance play a vital role in the fiercely competitive market where so many rivals competing against each other.[65]

- **Sustainable cost efficiency**

Cost leadership has been widely recognized and accepted in almost every pharmaceutical manufacturing organization all over the world. Before, the primary focus of cost efficiency has been to check the acquisition cost of raw materials. But from the perspective of sustainable cost leadership, a total cost in use may be better applied in reality when considering that lower cost materials may lead to compromises in manufacturing efficiency and product performance. Economical profits can be realized through consistently cooperation with highly qualified reliable suppliers. Their certificated testing process and method of raw materials, including identity, purity, safety and effectiveness, will lead to reduced testing requirements. Thus improved lead time, reduced inventory requirement level and holding cost such as insurance, taxes, and saved working labor and capital will naturally come along.

A typical example is that Capsugel is certificated by a large multinational pharmaceutical company as their vendor by offering Capsugel's raw material services. This company reached a significant annual cost savings of $119405 in sample collection and preparation, testing cost and inventory savings.

- **A new paradigm for capsule-filling efficiency: Speed, Yield & Downtime**

With the solid foundation of formulation, equipment and capsule, the sustainable cost efficiency can be strengthened through increased production speed, improved yield and reduced downtime. These three factors are interrelated and generating in one aspect may benefit others.

1. Increased speed: the faster the production is, the less the cost will be. With the same amount of resources such as equipment and working labors, the more products are produced within the same time, the less is the manufacturing cost, including both depreciation cost of utilities and fixed costs such as rent and insurance.

Company A invited Capsugel to evaluate their capsule-filling operation. The Technical Service Engineer found that the capsules are not separated at higher speed. This is mainly due to the lower running speed compared to rated speed of their capsule-filling machine. The root reason is the vacuum pump was not compatible for

the separation of capsules at the higher speed. With upgrade, the speed increased by 83% and more annual increase of $365000 was reached.

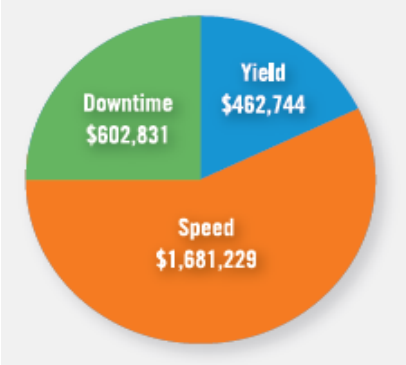
2. Improved yield: the filling powder materials can be accounted for the majority cost in an encapsulated tablet. The savings obtained from yield improvement are resulted from the fewer losses of material and saved time and energy in producing fewer filled capsules which cannot be sold. Yield improvement has been the most critical target in capsule-filling operations since a little improvement in yield may generate substantial cost savings.

Company B had problems of poorly-joined capsules due to their intermittent motion capsule-filling machine. Investigation and inspection of this problem led to a lot of production time and constantly low yield. Capsugel Technical Service Engineer reviewed the problem and noticed that height of the counter bearing and timing of the movement in the setup of closing station need to be adjusted. As a result, downtime was eliminated and a 8% yield increase was reached with annually savings of $94000 in production.

3. Reduced downtime: the time for machine cleaning, breakdown maintenance, repair and replacement may waste some uptime thus leading to a lost in cost for a product. Significant improvement in downtime can be realized through both early-stage fit of formulation, equipment and capsule, and continuous preventive maintenance of the production capsule-filling equipment.

Company C experienced excessive downtime on a particular sticky product. Due to its sticky characteristic, the segments have to be cleaned frequently to avoid the non-seperation capsules situation in which the capsules sticking and attaching to the segments. It always resulted in several days' downtime and delay. With an ejection brush cleaning system designed and implemented by Capsugel Technical Service Engineer, the cleaning frequency has dropped dramatically and an annually $32000 downtime savings were arrived at.

All these three factors can interactively generate savings. In a review of more than 30 customer cases with the help of Capsugel Technical Service Engineer to improve capsule-filling operation efficiencies in 2013,a series of statistical date is listed as follows:[66]



1. Increased speed: Average speed increase of 36% per hour

2. Increased yield: Average increase of 6%

3. Reduced downtime: Average reduction of 128 minutes in 8 hours, for an average downtime improvement of 73%

Figure 17 Breakdown of Cumulative Cost Savings by Capsugel Customers [88] .

- **Measurement—Critical to Success**

As we've discussed above, improvements are important. Meanwhile, measurement of financial gains in improvement is also of equal importance. Just like the famous mathematician and physicist Lord Kelvin said："If you cannot measure it, you cannot improve it." In order to make up the existing filling-room performance metrics' shortage, Capsugel Technical Service Engineers provides a capsule-filling efficiency "savings " report which quantitatively calculates the business impact on detailed aspects in capsule-filling machines and process.

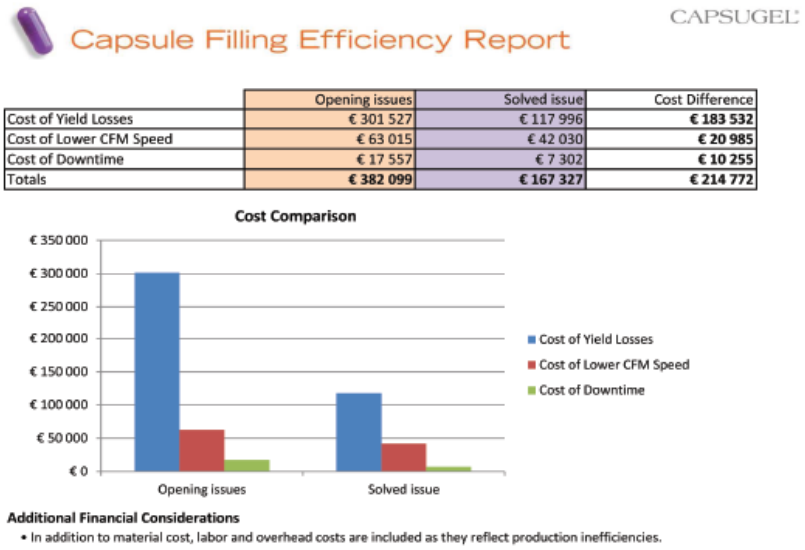


Figure 18 Capsugel's Reporting Tool for Productivity Improvement Programs.[88]

It demonstrates what impact a revision, repair or replacement will have on yield, speed and downtime. Shifting from previous focus on machine-related end-points such as hours of downtime, KGs of waste in operation to focus on these end-points' cost impact in reality, a more sound tool is provided to customers to justify their organizational decisions. They are more convinced to make decisions in obtaining resources, improve productivity in capsule-filling operations.

A typical sound example is that one company had problems with continuous defects after encapsulation. Capsugel Technical Service Engineers inspected that one excessively worn segment on the machine needs to be replaced. According to Capsugel's Capsule-Filling Efficiency Report, financial impact of the losses due to its worn segment was far beyond the cost of its replacement. With this, the production team finally justified and convinced their internal stakeholders of replacing the worn segments.

3.3 McDonald's case study

McDonald's corporation is the largest hamburger fast food chain restaurant with more than 35000 outlets in 119 countries over the world. The company was first founded as a barbecue restaurant by Richard and Maurice McDonald in San Bernardino, California in 1940.In 1955, businessman Ray Kroc joined the company as a franchise agent, and bought the chain restaurants from McDonald brothers gradually. Since then, McDonal's started to expand its business and grow as a fast food giant in the world.[67]

McDonald's adapts the operational form of franchisee, affiliate and corporation itself, and gains revenue from rent, royalties, franchisees payment and sales from restaurants. Its revenue has reached US$ 27.567billlion in 2012 and US$ 28.105billion in 2013,and net income of US$ 5.4648 billion in 2012 and US$ 5.5859 billion in 2013 respectively. It has become the world's second largest private employer, just behind Walmart, with 1.9million employees serving more than 68 million customers all over the world.[68]

McDonald's has advanced a lot in areas such as Knowledge Management, Innovation and Stock Management which in return makes it perform better than other uick service restaurants and stand the leading position in market. In the following we will take a look at these areas in detail.

3.3.1 McDonald's knowledge management.

Knowledge management theory is the process which helps to find, select, manage, disseminate, and transfer important information and expertise necessary for organizational activities.[69]Knowledge management theory has been perfectly applied within McDonald's to serve its customer and its daily up-to-date activities, helpful not only to connect and ease the communication between organization and its employees, but also to improve corporate office work with service. McDonald's content knowledge management process is shown as the figure below.

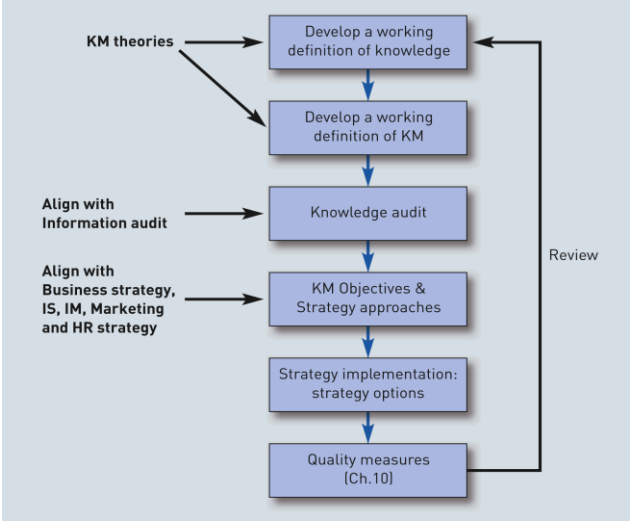


Figure 19 Mcdonald'S Content Knowledge Management Process.[70]

First, McDonald's develops a definition of knowledge and knowledge management according to their business strategy. Then the leadership carries out a knowledge audit which connects its business strategy with its knowledge management process. After that, knowledge management objectives are targeted for its implementation and measurement. In the implementation step,"Access MCD"was set up by McDonald's as a single and mutual corporate information source to improve its organizational data and asset management capabilities.

As a multinational corporation, McDonald's also endeavors to improve its process knowledge management. Due to the language and culture difference, the interpretation of the same product may vary in different areas which cause communication inefficiency. By establishing a global taxonomy with categorized information in detailed level successfully solves this problem. Besides, a research engine is embedded to allow user perform searches in both core repositories and local region sites. This system also adopts automation workflow, which ensuring fast and accurate working process. For example, a document in their site can be directly routed to translator as the user's instruction through which time and cost are saved [71].

McDonald's also share information with its staff, customers and partners through internet and their website in connection with their corporation knowledge base:

1. Self-service customer support:

The website self-service interface makes it possible for customers to solve problems themselves instead of time consuming e-mail and phone call. McDonald's knowledge management software also provides automotive answers in their database

to frequent customer questions, giving further support.

2. Corporate document and procedures share:

With the help of McDonald's knowledge website and software, it is very convenient to share, search, rank, and print corporate document and procedures, no matter which country, which region you are in, what language you speak and culture you have, you can always have instant and accurate access to them.

3. Reducing training time and cost:

Corporate policies, regulations, procedures and how-to guides are all available at McDonald's website which enabling self-learning among new staff. Corresponding training time and cost can be saved to improve their production, quality and service.

By setting central repositories and corporate website, software, McDonald's solves many problems related to knowledge share. For example, one corporation-wide document or one same product may have several different descriptions, due to their separate knowledge management system, workflow platform and different language. A lot of repeated communication between different restaurants may cost a lot of time, investment, and sometimes leads to critical mistakes. With this mutual central repositories and knowledge management system, the past problems such as communication misunderstandings, limited working efficiencies, and lack of knowledge to McDonalds' asset are solved. A typical case is that McDonald's uses Hazard Analysis Critical Control Point (HACCP),which is a management tool included in knowledge management system, to monitor and control their food production process, making sure that they meet the corporation food safety standard.

With knowledge management system, McDonald's regular working load has greatly reduced, such as manipulation of quantities of data, faxes, documents across different restaurants. Physical travelling has been reduced through mutual agreement with help of knowledge share. Customer also has access to corporation information through Customer Community Portal (CCP)which on one side improved customer communication, and on the other side makes corporate operation more transparent under public regulation, avoiding many safety and quality crisis. It also promotes communication with suppliers and helps to build good relationship with McDonald's business partners.

3.3.2 McDonald's innovation management

As known to all, McDonald's has been staying the leading position in quick

service restaurant (QSR) for many years. But latest research indicates that the customer focus is gradually shifting from convenient, fast food to more individualized type, which is a great challenge for McDonald's due to its emphasis on winning formula of instant and standard products and service. Thus continuous of hard work and product innovation based on market research is critically urgent for McDonald's performance improvement.

- **Competitive environment and consumer trend**

McDonald's is not the only QSR(quick service restaurant) in market, many other large burger and chicken chains and other small, similar fish and chips shops, take-away establishments all together compete with it, sharing the same market shown as below:

Sub Category	Category Description	Operator Examples
Informal Restaurants,	Restaurant that offers a sit-down meal in a casual environment, typically with waited service	Carluccio's, Nando's, Pizza Hut, Wagamama
Fast Food & Takeaways	Outlets serving food that can be prepared and served very quickly, and without waited service	Burger King, KFC, McDonald's, Wimpy
Coffee Shops	Coffee and food-focused caf és and bars, including branded and independently managed establishments	Costa Coffee, Pret A Manger, Starbucks, Subway
Sandwich Bars And Caf és	Combination of caf és and grab & go ranges at assorted retailers, including c-stores, department stores, petrol retailers and supermarkets	M&S Café, Sainsbury's, Spar, Tesco, Wild Bean Caf é
Retail Grab & Go, Caf és	Public houses and bars selling food, including managed and leased outlets	Beefeater, Harvester, JD Wetherspoon, Toby Carvery
Pubs	Sit-down and grab & go facilities in the workplace , but excluding vending machines	Assorted contract caterers, branded concessions and in-house catering solutions
Workplace Leisure	Includes locations where food and beverage supports the primary reason to visit, including shopping centers, theme parks, sports arenas, music festivals and concerts	Assorted contract caterers, branded and independent concessions
Travel	Food service facilities for consumers in transit – including prior and during travel	Little Chef, Road chef, Upper Crust, Welcome Break

Table 9 Sub-Categories and Descriptions within The Informal Eating Out Market [72]

In the market with these competitive rivals, the pressure on McDonald's largely

due to the reasons that they either copy the McDonald's business mode and develop it ahead in market or promote new strategy and ideas such as urban stores and petrol stations selling take-away food.

Meanwhile, the consumer trend has also been gradually changing. With the increasing income, people have more options to shift eating out into a individualized experience than a routing fast food. Besides, people are more aware of healthy problems, moving from burger and chips to more healthy diet such as sandwiches and salads. And of course, price is still a critical influencing factor when customers make decisions [73].

- **McDonald's reaction and innovation to the market**

According to the competitive market and consumer changing trend, McDonald's set up a series of strategy called 4Ps as below:

1. Product: make more healthy menu list and food combinations, such as chicken, beef, salad, and healthy juice for children.
2. Price: provide customers with reasonable price
3. Place: try to make restaurant convenient, close to clients, such as shopping center, office building, etc.
4. Promotions: McDonald's spends more investments on advertisement for its promotions such as healthy diet, festivals, etc.

Furthermore, after analysis of market and clients, they found that there are still some potential customers in this mature market, such as mums with kids and white-collar office workers. Mums with kids are usually busy with taking care of family; occasionally "time out" with other similar mums or close friends seems to be very precious to them. For white-collar office workers, all day busy working with computers and documents make them very tired, a quick break from office with colleagues and friend will be an excellent leisure time. [74] The common feature of both groups is that they appreciate high quality coffee in an attractive, quiet and cozy environment.

According to this, McDonald's set up a McCafé concept with special logo, targeting at female group aged 25-39, aiming at providing them a place to meet friends and have a quality coffee experience, and take care of children at the same time. The McCafé store put emphasis on comfortable place with relaxing music and welcome atmosphere. They also make different zones with family friendly environment and office relax reading and chatting environment respectively. Free car

parking lot and play ground also increase McCafé's attractiveness for those people.

Besides, in order to provide customer with more convenience experience, McDonald's also promoted innovation in their types of restaurant. On the basis of counter service, they set up "drive-through" or "McDrive" restaurant through innovation. These McDrives has separate stations of parking place, payment, order pick-up spots connected by automobile lane which enable drivers to purchase their take-away food without getting off their car in few minutes. McDrive has different types according to the customer quantity in different areas. For example, at highway entrance and exit, McDrive offers no counter and seats service; in downtown area, McDrive has shifted to "walk-through" service instead of "drive-through".

McDonald's actively react to the competitive market and ever changing consumer trend; takes customers' need in to account and analyze their expectations. Based on research, through innovation, McCafé with its high quality products and McDrive with its special service successfully complete and extends its share in the market, keeping the company ahead of its similar competing rivals, and realizing organizational performance improvement goal.

3.3.3 McDonald's stock management

McDonald's is a well-known quick service restaurant (QST) with more than 30000 restaurants spreading in over 119 countries, serving approximately 50 million people every day. Logistics as one critical process in the service production line, plays an important role both in meeting customers' needs and minimizing waste.

In order to satisfy the customer rapid-changing tastes, increasingly more kinds of products are launched to market, thus the challenge of reducing waste becomes even greater. Actually the waste reduction is realized through two approaches:

1. Fewer products are thrown away based on accurate demand forecasting.
2. Precise stock management of raw materials.

In the past, the stock ordering is based on restaurant manager's experience, knowledge, as well as the business selling data in the previous period. The next month selling amount can be calculated from selling result in this month and net sales growing rate. However other influencing factors such as holiday promotions are neglected during calculation. Besides, this calculation also needs long-term data collection to ensure its accuracy, much more time is been consumed from restaurant manager's limited working time, with less time and energy for quality, service and cleanliness promotion. In this background, McDonald's set up a restaurant supply

planning department with specialists in central stock management area, aiming at collect business influencing factors such as holiday promotions mentioned above, analyze and put them into McDonald's planning and forecasting system (Manugistics) to accurately forecast and manage the balance between demand and stock.

- **Stock classification**

Stock is defined as the product a company buys, produces and sells. McDonald's categorize their stock into three classifications as below:

1. Raw materials:

The components or ingredients will go into the production process. In McDonald's these raw materials are mainly burger materials including buns, beef patties, salad, and some paper cups and packaging .They are delivered to restaurants regularly, say like 3-5 times a week by truck in which the materials are stored in different temperature section, such as frozen, chilled and ambient temperature thus to ensure freshness.

2. Work-in-process materials:

The stocks are in the manufacturing or cooking process for final selling products. McDonald's will have some prepared amount of bun, beef patties, cheese, onions, lettuce and sauce for customers' order, ensuring the hot and fresh burgers delivered to them.

3. Finished products:

In order to satisfy customers' need during peak sales period, finished products such as Big Macs, side salads, Fish Filet are prepared for instant sales.

4. Stock mechanism:

In McDonald's, they have material mechanism called first in, first out (FIFO) mechanism in which all the materials, no matter raw, work-in-process or finished, will follow this rule, ensuring the freshness of food sold to customers.

- **Stock management**

Too much stock will bring too much related costs; too less stock will lead to product shortage thus influence sales. Stock management is the process to make sure that there is sufficient stock for customers and not too much waste. In stock management, three critical components [75] are discussed below:

1. Planning and supply management:

Efficient communication between central restaurant supply planning team and subsidiary restaurant makes stock management more effective. The central team consists of 14 regional planners, a mix of stock control specialists and experienced workers in restaurant, responsible for 80 restaurants and communicates with them regularly though telephone or e-mail as the figure shows below. Any customer or sale influencing factors will be recorded respectively and taken into consideration forecast calculating.

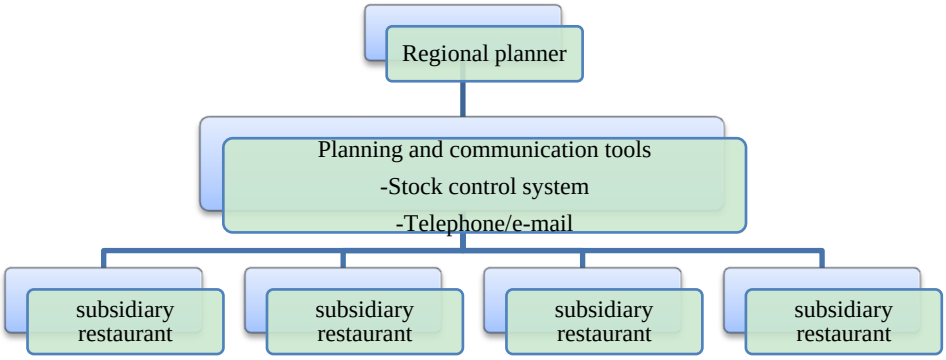


Figure 20 McDonald's Stock Supply Management Structure

Regional supply planners are responsible to control raw materials allocation from McDonald's distribution center with the help of stock control system (Manugistics) .Restaurants can have enough time and energy for producing qualified food and service according to customers' need.

2. Forecasting:

Forecasting is important for stock management due to its estimation of future sales. Forecasts are calculated based on several facts as below:

1).Subsidiary store historic products and data in last two years

2).Subsidiary store and national-wide casual factors. Including promotions like "buy one get one free", or Mcflurry and salad sales increase due to weather condition, etc.

3).Information obtained from managers about factors which may influence demand, such as road closure due to construction, local festival and promotions, etc.

- **Stock control charts**

McDonald's stock control system, Manugistics, makes future sales forecasts for subsidiary restaurants, based on their products and sale history in past two years as the

figure shows below. The blue blocks stands for a causal factor, such as promotions, holidays, with start and end date. A forecast been circled will be calculated through complex calculations.

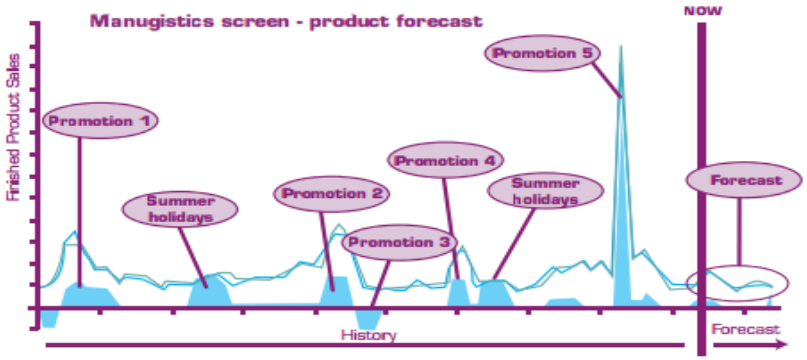


Figure 21 Manugistics Screen-Product Forecast [75]

With the help of this stock control chart, restaurant managers can easily balance stock orders and customer needs. If actual sales exceed the expected sales, the stock will need to be ordered.

In this stock control charts, some details need to be mentioned as following:

1. Entering data:

In order to have accurate forecast, the restaurant managers need to make sure the precise data entering the system. The manager should be responsible to record input and output of critical items daily, and other items weekly according to their own business situation. Any deviations should be revised with the help of store computer system regularly.

2. Buffer stock and order process

Every restaurant needs to have an extra stock in case to satisfy unexpected higher demands. Weblog is a web-based communication tool for managers view and check stock order proposals. It provides data including how many items have been ordered, what the current stock level is and when the ordered items will be arrive. With a simple computer operation, exact quantities and descriptions of stock will be displayed in screen, which makes the stock management more cost-effective and efficient.

- **Benefits from stock management**

Many benefits are generated from McDonald's centralized stock management

system, not only for restaurant and managers, but also for customers, shown as following:

1. Customer can always have the food they ordered, due to less running out of stock.
2. The system helps to calculate and forecast so that managers' time is saved.
3. The system with easy access for restaurant managers to control stock, ensuring the order is always in time.
4. Good management of stock will lead to less waste, thus cost savings can be used for food and service quality improvement for customers.
5. The stock forecast is more accurate based on past performance and computer system calculation, emergency deliveries can be reduced, thus more money saved.
6. Stock level can be maintained at an optimal level, which ensures the food delivered to customers is always fresh, even for a promotion; stock can be automatically adjusted to avoid waste.

In a conclusion, with effective stock management, the managers can operate restaurants in a more responsible way. Efficient use of materials will minimize society resources' waste, more cost savings can be passed on to customers with better service and lower prices. More customers will in turn lead to better business performance and profit. A well-organized stock management system leads to a sustainable development for McDonald's, as well as a win-win situation for its customers and society.

3.4 Shell case study

Shell is known as one of the world's largest energy and petrochemical multinational corporations. It is founded by merger of Royal Dutch Petroleum and UK-based Shell Transport &Trading, with its headquarter located in Netherland. In terms of revenue, it is the fourth largest company in the world with US$ 421.105 billion in 2014, which taking 84% of Netherlands'' GDP. Shell actively takes part in every area in oil and gas industry, ranging from exploration, production, refining, distribution and marketing to petrochemicals, power generation and trading. It has 2% of the world oil share and 3% of natural gas. Shell's fuel retail net consists of 44000 service stations in over 90 countries and sells transportation fuel to 10 million customers every day. It has 94000 average number of employees and produces around 3.1 million barrels of oil equivalent per day.[76]

As an oil and gas corporation, Shell endeavors to develop a sustainable development with its stakeholders, especially with Triple Bottom Line and

Stakeholder theory implementation into its daily management process. In the following, we will take a look at these two aspects in Shell.

3.4.1 Shell triple bottom line

As is known to all, oil and gas industry is supposed to be one of the most polluting in the world. Since John Elkington raised Triple Bottom Line Theory in 1994, the leadership in Shell has recognized its importance to corporation's sustainable development, and kept implementing it into their management process. Now we will follow three pillars[77] in Triple Bottom Line theory to see Shell's dedication as follows:

- **Financial Dimension:**

1. Production:

Shell is mainly devoted into three areas in their business: gas and electricity; refined oil products and chemical products. In upstream production, they deal with oil and gas exploring and producing, oil sand mining, gas liquefying, oil and gas transportation in pipeline, and wind power generation. In downstream production, they do business in manufacturing supplies, oil and chemical products, for example like petrochemicals and biofuels.

2. Revenue and net income:

Shell reported a decline in revenue for 2014 of nearly 7% to US$421.1 billion from US$451.2 billion in 2013.Net income in 2014 was US$14.730 billion; nearly 11% decrease from US$16.525 billion in 2013.Most of net income comes from its upstream production activities.

3. Revenue regional breakdown:

Global regions	2014 revenue(billion)	Percentage (%)
Europe	154.71	36.7
Asia, Oceania & Africa	149.87	35.6
USA	70.81	16.8
Other Americas	45.71	10.9
Sum	421.1	100

Table 10 Shell Revenue Regional Breakdown[78]

Through these data and statistics above, we can have a basic impression of how much effort it is necessary for sustainability development. Shell has a large weigh of its financial income dependent of non-renewable energy. In order to have a sustainable development in the future, it's a trend for oil and gas corporations like

Shell to take some sustainable actions according to its size and make a positive impact on the environment and society.

- **Environmental dimension:**

1. Environmental partners and alliances:

In order to build an environmental harmonious corporation, Shell cooperates with more than 100 scientific and conservation organizations in over 40 countries. Together with these partners, they endeavor to protect and restore biodiversity. Besides, Shell actively collaborates with local governments and industry associations to discuss environment protection issues and conduct related environmental activities.

2. Spills and discharges:

Shell is always devoted into spills prevention and discharge control. They have clear requirement and procedures to maintain and improve their facilities and pipelines. But due to operational failure, accidents, unexpected corrosion, sabotage and oil theft happen.

In 2014, Shell has reached the lowest level of spills. In terms of volume, the operational spills of oil and related products has decreased from 0.9 thousand tonnes in 2013 to 0.7 tonnes in 2014.Also the hydrocarbons discharge to surface water in 2014 has dropped to 0.9 thousand tonnes from 1.0 thousand tounes in 2013

For the Nigeria operational spills accident in 2008, Shell has announced a £55 million settlement agreement with the Bodo community in Nigeria, which shows its concerns and care of remaining problems there in Nigeria. [79]

3. Greenhouse gas emissions:

Greenhouse gas(GHG) emissions includes CO2,methane,nitrous oxide and hydro fluorocarbons. Shell manages GHG emissions through energy efficiency improvement of their operational facility use. According to Shell sustainability report in 2014, direct GHG emissions on a CO2 equivalent basis has increased slightly from 73million tonnes to 76 million tonnes in 2014 due to its production increase in Brazil, Iraq and Nigeria.

Another contribution to GHG emission is flaring and venting of natural gas from upstream production process which leads to pollutions such as global warm and climate change. Shell has flaring policy set by HSSE&SP Control Framework which require that new facilities should be designed without continuous flare and rent, existing facilities should gradually reduce flare and venting through safe procedures.

Shell has also attended World Bank's Global Gas Flaring Reduction(GGFR) for many years which is an organization aimed at flare reduction through government, companies and development organizations' effort.

4. Fresh water use and recycle:

Due to the limited supplies and extensive water use worldwide, Shell develops water management plans in water scarce areas for their facility, indicating how to minimize water use and increase water recycling. From the figure below, we can clearly notice the fresh water use decline in recent years in Shell.

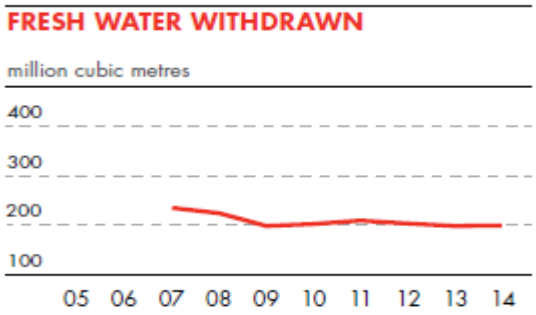


Figure 22 Shell Fresh Water Withdrawn [79].

5. Biodiversity and habitat protection:

For environmental perspective, Shell also endeavors to keep and protect the nature's biodiversity. They cooperate with conservationists and experts of nature science, and use advanced technology to decrease the impact of its production activities. Besides, they also have biodiversity plans for mitigating its impact on natural environment and ecosystem in many countries, such as Australia, Brunei, USA, and Gabon.

Habitat protection and restoration is another environmental activity Shell has besides biodiversity. For example in Arctic, Shell has started to investigate, evaluate the impact of Arctic environmental and social development with some environment organizations, local communities and similar industries since 2010,which is aiming at protect the habitat and make a sustainable development plan in that area.

In conclusion, Shell has take a series of measures to be an environmentally friendly corporation, such as partnerships and alliances with environment protection organizations; technology upgrade to reduce waste, fresh water use and energy consumption; less oil spills and discharges; biodiversity and habitat protection; on-process of developing bio-fuels and clean energy, etc. The following data has shown statistically what Shell has been devoted in environmental protection.

ENVIRONMENTAL DATA

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Greenhouse gas emissions (GHGs)										
Direct total GHGs (million tonnes CO_2 equivalent) [A]	76	73	72	74	76	69	75	82	88	93
Carbon dioxide (CO_2) (million tonnes)	73	71	69	71	72	66	72	79	85	89
Methane (CH_4) (thousand tonnes)	126	120	93	133	128	127	126	119	124	173
Nitrous oxide (N2O) (thousand tonnes)	1	1	1	1	2	2	2	2	2	2
Hydrofluorocarbons (HFCs) (tonnes)	16	17	23	22	23	25	23	28	24	20
Energy indirect total GHGs (million tonnes CO_2 equivalent)	10	10	9	10	9	9	n/c	n/c	n/c	n/c
Flaring										
Flaring (Upstream) (million tonnes CO_2 equivalent)	13.0	7.4	7.7	10.0	10.4	7.8	8.8	9.7	14.3	20.8
Flaring (Upstream) (million tonnes hydrocarbon flared)	3.8	2.1	2.3	3.4	3.6	2.6	2.8	3.4	4.8	7.0
Nigeria [B]	1.3	1.1	1.5	2.0	2.4	1.9	2.3	2.5	3.7	5.8
Rest of world [C]	2.5	1.0	0.8	1.4	1.2	0.7	0.5	0.9	1.1	1.2
Energy intensity										
Upstream excl. oil sands and GTL (gigajoules per tonne production) [D]	0.87	0.89	0.83	0.75	0.74	0.76	0.74	0.78	0.78	0.71
Oil sands (gigajoules per tonne production) [E]	6.3	6.5	6.6	6.4	6.8	6.6	6.4	5.7	5.3	5.2
Refineries: Refinery Energy Index [F]	94.9	95.6	98.4	100.8	101.8	102.2	98.9	98.6	98.4	98.0
Chemical plants: Chemicals Energy Index	90.3	89.8	91.7	90.8	89.3	92.0	93.0	92.6	92.5	95.8
Acid gases and VOCs										
Sulphur oxides (SO_x) (thousand tonnes SO_2)	97	99	113	136	139	141	175	212	233	226
Nitrogen oxides (NO_x) (thousand tonnes NO_2)	146	156	147	146	159	142	150	145	154	157
Volatile organic compounds (VOCs) (thousand tonnes)	151	89	89	129	147	126	130	148	185	199
Ozone-depleting emissions										
CFCs/halons/trichloroethane (tonnes)	0.0	0.0	0.0	0.0	0.0	0.4	1.4	0.6	0.3	0.8
Hydrochlorofluorocarbons (HCFCs) (tonnes)	6	8	8	12	21	24	26	27	35	35
Spills and discharges [G] [H]										
Sabotage spills – volume (thousand tonnes) [I]	2.7	2.2	3.3	1.6	3.0	14.0	6.5	3.4	1.9	1.5
Sabotage spills – number [I]	139	157	137	118	112	95	115	197	123	111
Operational spills – volume (thousand tonnes) [J]	0.7	0.9	2.1	6.0	2.9	1.4	8.8	3.5	3.9	3.4
Nigeria	0.3	0.4	0.2	5.3	0.7	0.3	7.1	1.6	1.4	0.1
Rest of world	0.4	0.5	1.9	0.7	2.2	1.1	1.7	1.9	2.5	3.3
Operational spills – number [K]	153	174	207	211	195	275	275	392	465	560
Nigeria [L]	38	31	37	64	32	37	42	52	41	63
Rest of world	115	143	170	147	163	238	233	340	424	497
Hurricane spills – volume (thousand tonnes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9
Oil in effluents to surface environment (thousand tonnes)	0.9	1.0	1.0	1.3	1.6	1.5	1.7	1.6	1.8	2.3
Water										
Fresh water withdrawn (million cubic metres)	199	198	203	209	202	198	224	235	n/c	n/c
Waste disposal										
Hazardous (thousand tonnes)	529	770	820	740	1,048	962	688	907	716	631
Non-hazardous (thousand tonnes)	1,674	2,065	2,295	1,850	1,079	1,139	996	1,899	1,154	632
Total waste (thousand tonnes) [M]	2,203	2,835	3,115	2,590	2,127	2,101	1,684	2,806	1,870	1,263

Figure 23 Shell's Environmental Data in Recent Years.[79]

- **Social dimension:**

1. Social investment:

Shell choose those projects and investments which can also benefit local communities and with sustainable long-term development. In 2014, they have spent $160 million on voluntary social investment, has increased $1million compared to that of 2013.Their social investment covers areas such as education, biodiversity, enterprise development, energy access, road safety, etc. shown in the figure below. Also they focus investment on poverty-stricken areas which have GDP less than $15000 a year per person to support their development. This social investment also has support from Shell employee's voluntary work and donations of equipments.

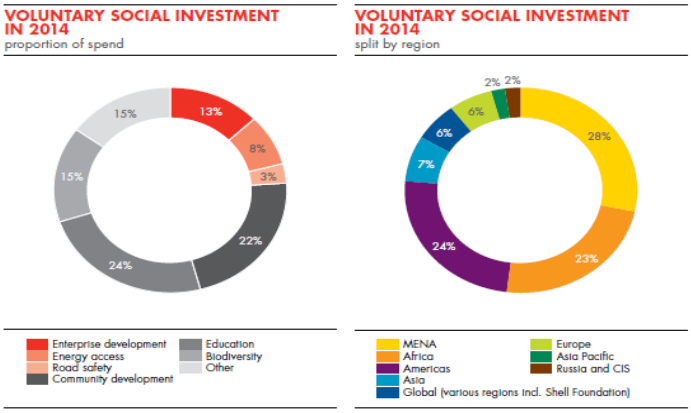


Figure 24 Shell Voluntary Social Investment in 2014.[79]

2. Local procurement:

Shell support local business and development through procurement of goods and service from local suppliers. In 2014, they have spent $13.7 billion in lower-income countries which have GDP less than $15000 a year per person. Shell also evaluated 1074 suppliers' quality, which must complies with sustainable development factors set by them including good working conditions, human rights, no child and forced labor, etc.

3. Employee training:

Shell focus on sustainable development by investing in training for its employees and some joint venture partners. All drilling engineers goes for training and are required to pass certain subjects and programs. All employees and contractors must take training in Shell's Code of Conduct, which is a series of business principles and regulations in Shell. Those who cannot pass, their contract will be terminated. All together, more than 4000 employees took leadership skills training, of which 481 are professions. Shell has spent $342 million in training and development by providing 617000 training days to its employees in building technical, commercial capability and safety competencies.

4. Diversity in employees:

Shell states that they provide equal opportunities for people, regardless of their nationality, gender, color, ethnicity, and physical ability. They will try to give reasonable adjustment to people according to their ability for their best career development. Also this understanding of diverse talent will, in return, benefit the corporation by their contribution and dedication. Take female percentage in leadership positions for example, in 2014,Shell has 18.2% senior positions with women

employee compared to 17.2% of that in 2013.Further more,71% of Shell's employees feel positive about its inclusiveness of their workplace in 2014,which has increased by1% compared to that in 2013,and the negative proportion is 11% in 2014,the same as that of 2013.

5. Employee involvement and communication:

Shell strives to lead and keep a health relation, open access between employees and management. Councils and trade unions are set for employee's appropriate dialogue both anonymously and openly. Senior manager will evaluate employees' behavior on Shell's operational and financial performance. And in return, employees' engagement, suggestions, degree of commitment and involvement can be also assessed through a principle tool called Shell People Survey. The result in 2014 was 80% employees favorable of their engagement in corporation's business operation, same as that in 2013,and 5% of unfavorable. Employees can express their suggestions, opinions through various channels such as telephone helpline, website, ensured by regulations and principles such as Code of Conduct, Shell General Business Principle, etc.The following data has shown statistically what Shell has been devoted in social dimension.

SOCIAL DATA

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Fatalities										
Total number	5	5	8	6	12	20	26	21	37	34
Employees	3	0	3	1	0	1	2	1	2	3
Contractors	2	5	5	5	12	19	24	20	35	31
Fatal accident rate (FAR)	0.74	0.79	1.32	0.96	1.56	2.3	3.4	3.1	5.6	5.0
Fatalities per 100 million working hours (employees and contractors)										
Injuries and process safety incidents										
Total recordable case frequency (TRCF)	0.99	1.15	1.26	1.24	1.23	1.4	1.8	1.9	2.1	2.5
Injuries per million working hours (employees and contractors)										
Lost time injury frequency (LTIF)	0.28	0.36	0.34	0.36	0.35	0.4	0.6	0.7	0.8	1.0
Lost time injuries per million working hours (employees and contractors)										
Operational Process Safety Events										
Tier 1 [N]	57	65	91	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Tier 2 [N]	194	246	308	n/c	n/c	n/c	n/c	n/c	n/c	n/c
Illnesses										
Total recordable occupational illness frequency (TROIF)	0.96	0.77	0.51	0.66	0.76	0.6	1.2	1.5	1.8	2.0
Illnesses per million working hours (employees only)										
⊞**Security**										
Using armed security (% of countries)	24	19	17	14	9	17	17	16	15	19
Using armed company security (% of countries)	1	3	0	1	1	1	1	2	2	2
Using armed contractor security (% of countries)	10	8	10	9	6	10	9	12	9	11
Gender diversity [O]										
In supervisory/professional positions (% women)	29.0	28.8	28.1	27.3	26.3	26.4	24.7	24.6	23.2	21.8
In management positions (% women)	21.0	18.8	18.2	17.6	17.0	16.1	15.3	17.7	16.2	12.9
In senior leadership positions (% women)	18.2	17.2	16.2	16.6	15.3	14.0	13.6	12.9	11.6	9.9
⊞**Staff forums and grievance procedures**										
% countries with staff access to staff forum, grievance procedure or other support system	100	100	100	99	100	99	100	100	99	100
⊞**Child labour (% countries with procedures in place)**										
Own operations	100	100	100	100	99	98	100	99	95	88
Contractors	100	100	100	97	96	97	99	98	89	69
Suppliers								96	82	62
⊞**Forced labour (% countries with procedures in place)**										
Own operations	100	100	100	100	99	98	n/c	n/c	n/c	n/c
Contractors and suppliers	100	100	100	97	95	89	n/c	n/c	n/c	n/c
Integrity										
Code of Conduct violations [P]	267	181	209	226	205	165	204	361	n/c	n/c
⊞Contracts cancelled due to incompatibility with Business Principles	7	22	14	11	40	24	49	35	41	63
⊞**Contracting and procurement**										
Estimated expenditure on goods and services in lower-income countries ($ billion) [Q] [R]	14	12	14	12	13	12	12	13	10	9
Social investment [S]										
⊞Estimated voluntary social investment (equity share) ($ million)	160	159	149	125	121	132	148	170	140	127
⊞Estimated social investment spend (equity share) in lower-income countries ($ million) [T]	73	74	67	45	61	54	61	65	n/c	n/c

Figure 25 Shell's Social Data in Recent Years.[79]

As shown in the figure, Shell has a positive performance in sustainability development in social dimension: contribution to local contracting and procurement; well-developed staff training; decreased number of fatalities at work; diversity of employment; well-set human right policy and mechanism, etc.

3.4.2 Shell stakeholder theory

In the world's energy background, oil and gas are essential energy but non-renewable, with the increasing demand use from market, other replaceable clean energy is a future trend. Under this situation, Shell proposes their two main target:

1. Behave efficiently, profitably and responsibly in oil, gas and chemical area.

2. Positively take part in search and development of other clean energy to meet customer, environment and world increasing demand.

Like other large organizations, Shell also has many different stakeholder groups. They either are effected by or have an influence on its business and operation. In this case study, we will discuss how stakeholders influence Shell's target realization and how Shell satisfy its stakeholder's needs and reach economic, social and environmental balance in its work from perspective of different stakeholder groups as follow:[80]

- **Internal stake holders**

Shareholders, employees and suppliers make up Shell's internal stakeholders group.

1. Shareholders:

Shareholders are those people and group who provide the capital foundation to set up and run the business. They give directions to the company though specified board of directors. The directors will make a long-term organizational strategy and are responsible for its implementation. According to its annual performance, an annual performance report will be made and reported to shareholders. For shareholders, they can take dividend from the profits according to their shares.

2. Employees:

Shell has more than 100000 employees all over the world ranging from senior managers, geologists, market researchers, oil platform workers, site engineers, office administrators, business analysts and etc. They work together to commit in finance, market, sales, energy explorations and other Shell group business. Their performance

directly influence the organizational performance. Any errors or mistakes in work can cause large lost in terms of reputation, financial lost, even lives.

For Shell, it emphasis the healthy and respect to employees. It tries best to make a safe and competitive working environment for them, to keep them always in best condition to work safely and positively.

3. Suppliers:

Suppliers are also important to Shell's performance. Take their oil transportation contractor, for example, how efficiently and safely transform oil from well to pump is vital to its downstream production flows. Shell evaluates its supplier with a series of strict rules according to its organizational core value. If they are not qualified, they will not be used as suppliers.

- **External stakeholders**

Customers and communities are main external stakeholders of Shell. They do not directly involve in its production and business process, but they have great influence on Shell's decision making process. Therefore, Shell is committing to satisfy its customers and communities.

1. Customers:

Customers are the final receiver of Shell's product and service. How to provide them products and service to meet their expectation in terms of quality, price, safety, and other environmental impact, by means of technology, commercial methods and environmental commitment is critical to Shell. Through market research and product research, Shell found that customers' priority is their energy products with good quality at a reasonable price. Further more, customers concerns about its environmental effect, such as oil and gas pollution, cleaner and efficient energy to reduce CO2 emissions.

In response, Shell set a series of global environmental standards and regulations for its production: control greenhouse gas, energy efficiency, reduce water pollution and waste, etc. And Shell also cooperate with its downstream contractors or customers in transportation industry such as trains, automobiles, airplanes and ships, to provide them with petro and gas after desulfurization thereby contributing to environment.

2. Local communities:

Local communities especially those live close to refineries always worry about

their safety, healthy and other side effects. Shell seeks to operate production with harmonious relation with its surroundings, creates mutual economic, social and environment development, and reduces negative impact as possible as they can. They over come citizens fear and worry by giving them lectures about necessary emergency procedures, informing them of their production plan, and some financial compensations. Besides, Shell also provides healthy facilities, donates and supports local education. One typical example is Shell's LiveWire [81] which is an online community giving young people instructions on how to turn their business ideas into reality.

- **Interest groups**

Shell works with a range of interest groups as following:

1. Governments: In order to set up operations in many other countries, Shell has to get approval from local governments of their business activities. Shell works with them to create job opportunities, provide energy supply, pay taxes, and reduce CO2 emissions, etc.

2. Business communities: Shell also has supply and logistics connection with many companies.

3. Other oil companies: Shell cooperates with other oil service companies and partners, and some government-owned companies to build new oil and gas supply lines and new refineries.

4. Media: Shell works with local media and through their positive propaganda in television, newspaper and magazines to strengthen their market position and attract new customers.

5. NGOs: Shell works with many non-government organizations ranging from local, national to international level, promote activities in environment, human rights, and heath.

In environment area, Shell cooperates more than 100 scientific organizations and learn from their experience, and also has 10-year relationship with International Union working on the conversation of nature, which is aiming at reducing environmental impact through operational changes.

In human right and health area, Shell commits to give their staff tools, protection equipment and professional training enabling them to work in safe environment, minimize risk. Shell also has series of working procedure, safety regulation and healthy center to give health care to their employees.

- **Sustainable development with stakeholders**

Shell claims that it is an important responsibility to protect stakeholders' investment. All the profits obtained is used in the form of dividend to stakeholders, invest again in research, development of new products, clean energy and better ways of providing fuel services. Shell combine three bottom line theory with their decision making when they have different opinions among stakeholders, following are the principles they made according to TBL theory:

1. The activity should have a good return for shareholders in economic aspect.
2. The decision should have suitable social impact on its employees and communities.
3. The plan should not have bad effect on environment.

Shell sets bottom line in economic, social and environment aspects,if there is a conflict investment on agriculture land, for example, stakeholders will have a meeting together to evaluate and balance its economic benefits, social opportunities and environment impact.

In conclusion, through continuous communication with stakeholders, Shell widely takes every group's expectations into consideration when making investment decisions. In order to resolve conflicts, Shell follows strict regulations and strategies in social, economic and environmental aspects, to realize maximum mutual value.

3.5 Case comparison

Based on the case studies in Chapter 3, here we conduct a brief analysis and comparison among four multinational corporations in terms of performance improvement theories discussed in Chapter 2,to see how they applied these theories into their daily operation and manufacturing process as shown in the table at the end of this chapter.

The performance improvement case studies in this research present many similarities in common. They four multinational corporations are quite similar for their large size, no matter in terms of revenue, net income or employees and subsidiaries all over the world; for their large market share and outstanding performance in their respective area; for their management core value in organizational performance for sustainable development; for their continuous efforts to increase organizational financial performance ,stakeholders' benefit, as well as environmental and social impact and organizational reputation in the market. They all

experienced the revolutionary progress from industrial age to information and technology age, no matter in terms of manufacturing area or service delivery aspect. They all have encountered development limits, crisis, and endeavored to analyze, address, and solve problems, thereby realized performance improvement, surpassed their competitive rivals and become leading giant in worldwide market.

The purpose of this research is to highlight some critical performance management theory, core value, influencing factors which could contribute to the final recommended performance improvement model plate for practical use or reference. The performance improvement methods differs in four cases due to their own weakness, organizational support and improvement maturity, as well as the resources, competence required by and influencing impact from the improvement methods and theories. Each case examined two or three methods or theories implementation in their organization. From defect/limit identification, root reason analysis, suggestions comparison, until detailed implementation and results evaluation, all the process in improvement activities are presented and discussed. Besides, their improvement work is also accessed with their competitive rivals, and companies in other manufacturing and service categories. For example, Toyota's learning organization and TPS are highlighted due to its improvement maturity advantage resulted from more than twenty years' organizational culture construction; Capsugel's Six Sigma success in quality management as a good tutorial case has been widely disseminated and accepted; McDond's knowledge management, innovation and stock management shed more light on their customer service excellence; For Shell, an oil and gas company, triple bottom line and stakeholder theory has helped it go through many environmental and social crisis such as Nigeria oil spill, winning a good reputation in industry.

In conclusion, the differences in four cases highlighted excellent performance improvement practices, and the similarities in various activities of the companies, the features of the common value, method and experience provided a solid base on which critical performance factors are abstracted and performance improvement model plate is organized in later chapters. In this study, it is difficult to accurately compare and evaluate improvement work among companies, because they all have their own organizational culture and characteristics. We can only get some core value from their successful implementation process, as reference, according to detailed situations.

	Toyota	Capsugel	McDonald's	Shell
Innovation	-Toyota i-road -Intelligent parking assist (IPA) -Intelligent clearance sonar(ICS) -Andon board & Kaizen ,etc	-Gelatin, liquid-filled &vegetarian capsule -Bioavailability enhancement, modified and targeted release, healthcare and sports nutrition suite.etc	- McCaf é -Drive-through or McDrive -Healthy diet, etc	- Shell Technology Center in technical R&D: enhanced oil recovery, managed pressure drilling, etc. -Shell tech work & Shell Small Business Innovation Initiative, etc
Knowledge management	-Organizational core value: TPS, Toyota Way, Genchi, Hansei,etc.	-Six sigma for quality control -Capsule filling machine technology	-Access MCD -Customer community portal(CCP) -Global knowledge taxonomy	- Shell Wiki: a platform for employees to collaborate and share knowledge
Learning organization	-Corporation spirit inheritance and dissemination within all levels of staff	-Learning mechanism from customer needs, clinical challenge, and pharmaceutical regulations in manufacturing process	-Internet training course -teamwork and training cooperate with Hamburger University(College Credit Connection program)	-Scenario planning -Double loop learning -Kolb's learning cycle(concrete experience, reflective observation, abstract conceptualization & active experimentation)

Table 11 Comparison of Case Studies

	Toyota	Capsugel	McDonald's	Shell
Resource-based theory	-Mass production to lean production -Small scale of employment for strategy alignment	-World leading capsule filling technology and manufacturing skills	-Flexible process-based organizing capability in McDonald's -Consistency of products and service worldwide	-Decentralization, focus on local autonomy &decision consensus -Culture focus on technical and scientific expertise
Stakeholder theory	-Deliver reliable and quality driven cars -Effective communication and fast reaction in recall crisis	-Satisfy their customers' need through proper technologies and specialized production capabilities	-Manugistics system to manage relationship with suppliers -Self-service and CCP to satisfy customer, etc	-Cooperate with local government, communities and NGOs for mutual benefit and sustainable development.
Triple bottom line theory	-Low carbon society by electric & hybrid cars -Smooth transportation by Toyota i-road and safety innovations	-Diverse capsule technologies benefit patient and community -Environmental manufacturing process with less pollution	-Bio-plastic packages, grass-fed cattle, waste recycle with environmental concern -Healthy diet for social obesity problem, etc	-Revenue &net income -Green gas emission, water recycle, biodiversity protection in environment -Local procurement, staff training and diversity, fatality control in society.

Table 12 Comparison of Case Studies

Chapter 4 Analysis and results

4.1 Critical performance factors

Based on the basic strategic theories and methods discussed in Chapter 2 in terms of organization performance management, and the practical case studies in Chapter 3 which reflect how to implement them in to practice, some performance improvement factors are abstracted and concluded, which is of great importance for those performance improvement work involving non-specialists, providing as a guide to find and analysis potential improvement factors as a starting point in their daily work.

In the year of 2000,Heshmati put forward an approach called CLEM categorization in which he concluded many operational performance influencing factors and divided them into four categories: capital, labor, energy and material respectively.[82]Based on this, a model with the most extensive performance factors is presented below:

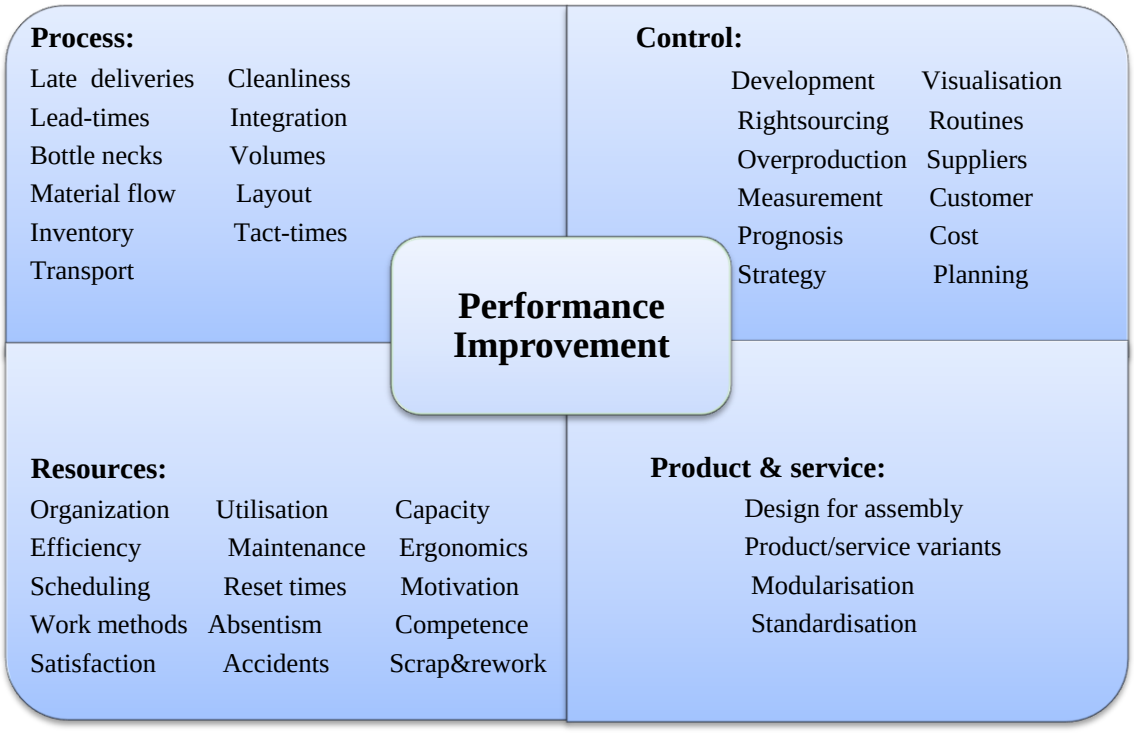


Figure 26 Model of Factors Influencing The Performance of Operations.

This model also categorizes performance influencing factors into four aspects: process, resources, control and product respectively.

- **Process category:**

Process as the most important part in the whole entirety of manufacturing or service, consists of series of independent and closely connected procedures. In these procedures, resources such as machines, employees, energy, capital are consumed to convert input into output. Output is again as input in next stage until the final product or service is delivered.

Factors may have impact speed and precision are included in this category, considering organizational process problems such as workshop logistics, cycle times and bottlenecks.

Attributes	Description	Measurement/Example
Late deliveries	Extension or delay in production.	% in failed deliveries
Cleanliness	Assess whether it is clean and tidy in operations	Toyota requires production plant cleanliness
Lead times	Delivery time between two operational points	McDonald's short lead times
Integration	Assess how the resources are connected as a whole	The distance and transportation time between different resource sites
Bottlenecks	The capacity and tact constraint in production	Measure in No. of bottlenecks
Volumes	Number of units produced in the production period	Capsugel's capsule production quantity per day
Material flow	Material flow/time unit	The No. of McDonald's beef patties per day
Layout	Whether the resources are laid reasonably for short and effective flow	Toyota car manufacturing Production line layout
Tact times	The capacity need from customer	Burger sales in McDonald's, measured in quantities/day

Table 13 Critical Performance Factors-Process Category

- **Control category:**

Effective and efficient control is necessary from the very beginning to the end of manufacturing process as it guides, regulates the operations of machine, employees, financial and technical aspects involved and examines the final products and feedback

from customers.

The factors included in control category are those have influence on administration and financial functions in operations.

Attributes	Description	Measurement/Example
Development	Resource, technology, process and products development	Detailed plans and development
Visualization	In the operational process, the degree of monitoring and description by front-line workers timely	Andon board in Toyota
Cost	Cost for a performance improvement work	New production line cost in Toyota
Routines	The passage of information, operational process	Process map in shell's oil refinery plant
Overproduction	The manufacturing capacity compared to customer/market need	More chips production compared to sales in McDonald's
Suppliers	The relations with venders and the product quality from them	No. of suppliers, control &relationship in McDonald's
Measurement	Whether relative factors are measured during the operational process	Waste/muda is measured in Toyota to be more efficient
Customer	Relations and closeness	McDonald's customer reflection &feedbacks
Prognosis	The percentage of accuracy in prediction	Next season net income prediction in Capsugel
Right sourcing	Which operational process is outsourced and whether it is aligned with organizational strategy and benefits	The quality of outsourced platform manufacturing in shell.
Strategy	Whether the strategy is made with consideration of operations feasibility	Toyota strategy feasibility analysis
Planning	Whether the plan is implementable in reality	Shell evaluates whether the plan is implementable in reality

Table 14 Critical Performance Factors-Control Category

- **Resource category:**

Resources factors refer to those may influence the flexibility and technical

performance in land, labor, capital, employees, materials, equipment and machines in the operational process of products /service. Energy, information, technology, management and expertise are also included in this category. A well organized resource utilization mechanism will eliminate waste, increase efficiency and reach financial benefit in the end.

Attributes	Description	Measurement/Example
Organization	How the organizational structure, culture, etc contributes to manufacturing efficiency	Toyota hierarchy structure
Utilization Efficiency	How well the resources are used	Measured in OEE (overall equipment effectiveness)
Maintenance	-Corrective maintenance -preventive maintenance	Maintenance of capsule-filling machine in Capsugel
Scheduling	The plan and arrangement of jobs with consideration of supporting small batches in production	Measured in batch size
Reset times	Set-up times between operational jobs	Internal and external ones included
Work methods	The use and spread of work analysis methods	Dissemination of TPS in Toyota
Absenteeism	Employees absence from work	Measured in No. of days/time
Capacity	The production ability according to resources	Measured in numbers of units/time
Ergonomics	How well the ergonomics are applied to workstations	Safety working suit on platform in shell.
Motivation	How the workers are encouraged to work according to demands	Reflected by their attitudes
Competence	The knowledge and capacity of workers themselves compared to the job demands	Realized through learning organization in Toyota
Satisfaction	Are the employees satisfied with their work situation	Shell devotes to satisfy their employees' need.
Accidents	Number of accidents happened in operation	Fatality, oil spill in shell
Scrap & Rework	Yield manufacturing or failure products	Measured in numbers of parts/million

Table 15 Critical Performance Factors-Resource Category

- **Product and service category:**

Product and service as the last delivery to customer is important as it stands for the outcome of organizational long-term efforts. Customer quality, assembly design, standardization and variants may have influence on product and service quality. Product design, assembly and variety related performance factors are included in this category:

Attributes	Description	Measurement/Example
Design for assembly	Whether there is design concept in terms of easy assembly	Pipeline assembly consideration in design process in shell
Modularization	The parts used can be replaced	Measured by No. Of interchangeable parts
Product variants	How well the products vary from each other	Capsule filling quantity variants in Capsugel
Standardization	Is there a standard production mode for components	Capsule manufacturing standard/regulation according to related law in Capsugel

Table 16 Critical Performance Factors-Product Category

As presented above, all these factors can be measured by some practical methods or statistic data, which, in return, enabling the model to be useful in feasibility analysis for a manufacturing process. These factors can be used to assess how well the operational activities are carried out according to different changing demands, whether it is worthy to make a change and how many benefit can be obtained in terms of strategy alignment.[83]Further, these factors can be use to balance or priories in the situation which there are many feasible performance improvement choices. Which choice has the best cost-efficiency ratio can be analyzed and distinguished according to these critical performance factors.

4.2 Process measurement

With all the performance factors concluded above as a feasibility and evaluation tool, we also need a process model which allocates these performance factors into different manufacturing processes and connects them as an entirety. This process model shown below not only helps us to clearly indicate which measurements we should use to evaluate corporate performance, but also gives us actual status of

improvement objectives as processing map guiding our performance improvement activities.

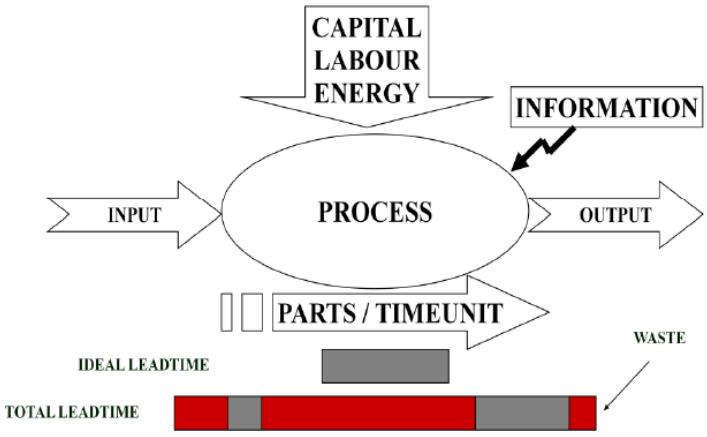


Figure 27 Process Model.[84]

The components in this process model also can be found in performance factors in Chapter 4.1; they all connect with each other and change with different performance improvement process.

1. Waste:

Waste should be the most important component in process model whose reduction and decline directly influence corporate performance. Other component will also change with the change of waste in process model.

2. Total short lead-time:

A short total short lead time can be realized with less waste, which influences process operational flexibility, giving possibility to keep low storage and work-in-process. With short total lead time, manufacturers will have more time and energy to focus on other performance factors, such as quality, customer satisfaction, etc. Waste, loss and downtime are related components and can be controlled with lead-time.

Complex process usually has longer lead-time because it consists of many small processed and needs more time to spend on preparation and scheduling. Parts/time unit is always used to complement total short lead-time in complex process.

3. Input and output:

It refers to transformation process where material in and product out happens in

non-service process. For service process, it refers to information transformation instead.

4. Others:

1). Information refers to process plan, organize, lead, and control of materials, production and products.

2). Capital and energy are related with process cost and are parameters of benchmarking.

3). Labor deals with both physical and mental personnel effort.

The components of PPP model: productivity, profitability and performance are closely connected, and can be realized through the process model as follows:

1. Productivity and performance are the ratio result of output and input. Lead-time and parts/unit time also have influence on them.
2. Profitability: it relates to the financial aspect of corporate performance, which can be affected by the capital, energy and labor when they deal with price and cost.
3. Lead-time and waste directly links to process effectiveness and efficiency.

The corporate performance improvement work should start with evaluation and measurement of performance factors, following the path indicated by process model, to monitor, check, and find defect, waste, loss, etc. Appropriate performance measurement are the basis to increase corporations' competitiveness, profitability as well as productivity in their manufacturing process. Together with perfect implementation of those performance improvement methods, theories ensured by their related evaluating parameters mentioned in Chapter 2, corporations' managers will be able to conduct effective performance improvement activities for their sustainable development in today's competitive market.

4.3 Regulating conditions towards excellent performance

From the case studies, we can see that all the companies differ in choosing proper improvement methods, theories, performance improvement factors in their operations. It is hard to say which theory, method, evaluating factor is better than another, because every theory, method, and factor has positive and negative effect. Furthermore, every theory, method and factor has their own conditions to be implemented so that their positive effect can be performed to the full extent. The

evaluation of methods, choice of improvement theories and critical factors should be based on the detailed situations within the organization, with consideration of where they can be applicable at the same time. In the following, we are going to show some regulating conditions towards excellent performance that need to be considered in practice as a reference for decision choice:

1. Organizational improvement maturity.
2. Organizational culture and structure background.
3. Market development trend and requirement.
4. Competence in terms of advantages and disadvantages, regarding improvement theories, methods and critical factors.
5. Surrounding environment including cultural, political, moral, and other issues.
6. Budget, cost and requiring resources including labor, knowledge, plant, time, etc.
7. Manufacturing and service complexity, layout, size, demand and capabilities.

A general choice of improvement theories, methods and critical factors should be adjusted to detailed business type. Their potential can only be realized after overcoming obstacles such as staff competence in terms of knowledge and skill; organizational resistance against change; extent, range and speed in implementation, etc. In a word, the decision of performance improvement strategy has so many aspects and influences to be considered before its implementation. Only a mature, widely accepted, scientifically proved improvement strategy can has its real effect on practical operations in business.

Chapter 5 Recommendation

5.1 Performance improvement model template

The model conducted in this chapter is considered to be Performance improvement model template. It is derived from the previous chapters' discussions:

1. The problems and challenges from Chapter 1 Introduction.
2. The performance improvement theories and methods from Chapter 2 Literature review.
3. The practical learning from Chapter 3 Case studies.
4. The critical performance factors and process model abstracted in chapter4.

The performance improvement model template is set up on the basis of balanced score card, consisting of 2 parts with 3 phases as follows:

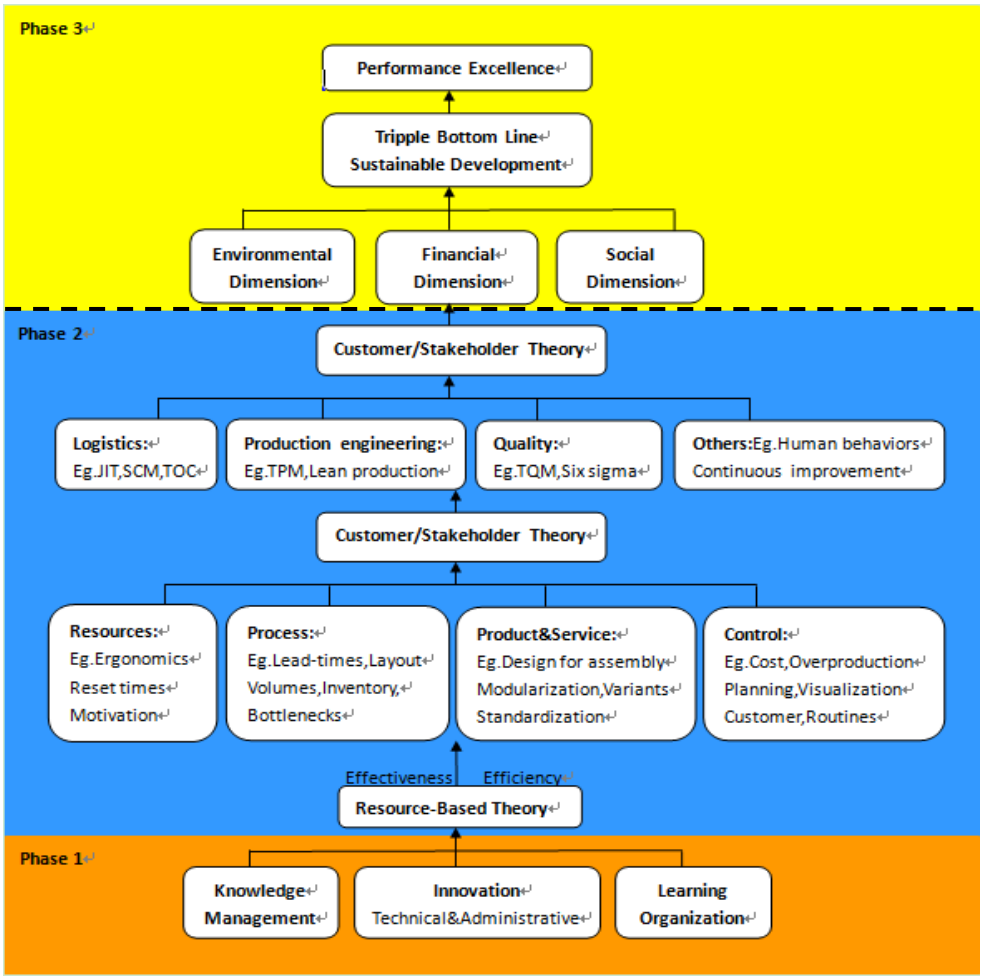


Figure 28: Performance Improvement Model Template.

This performance improvement model template provides both senior-level leadership and front-line workers with a strategic planning and management system that aligns business activities to its organizational strategy vision, improves its internal capabilities with external environment changes, and helps to measure, monitor and control organizational performance against strategic goals.

It retains traditional financial goals such as revenue, net incomes in terms of performance excellence. But in order to meet the requirements of multinational corporations in information age with long-term sustainable development, this model template also incorporates environmental and social concerns which can be realized through knowledge management, learning and innovation, etc. Besides, well-organized resource utility in its internal business process in manufacturing and service delivering, and good relationship with customer and stakeholders are also critical in daily management process. It balances financial and non-financial goals, short-term goals and long-term development through a series of leading attributes, thus to reach strategic focus and organizational alignment in performance excellence. As following, let's take a look into detail at this model template.

- **First part: Leading Attributes**

1. Phase one: Organizational Capability

In this phase, new driving force Learning Organization, Knowledge Management and Innovation act like three pillars to support and enrich organizational capability. It is getting more and more critical in information age to make progress in building capabilities and acquiring intangible assets for future growth besides financial results tracking in modern business. New technology, information and management ideas can be obtained and received into organization as their own capability through active learning activities, innovative culture and perfect knowledge management.

1) Innovation:

Innovation as the organizational energy source, both in technical and administrative aspect, brings fresh air into organization. New product with advanced technology, efficient assembly manufacturing line, creative staff, market oriented strategic planning and innovative culture and climate are good example of it.As discussed in Chapter 3,innovations in McDonald's such as McCafé, which coincides office ladies' needs for break and relax during busy working life; McDrive, which leads the concept of Quick Service Restaurant(QSR)one step further by enabling

drivers to order and grab food without taking off the car; Healthy diet, offsets the side effect of junk food which embedded in people's mind due to social problems such as obesity, attracting more and more customers and wining them a better reputation of healthy living style.

2) Learning organization and knowledge management:

In current climate of fast technological change, it is getting more and more necessary for knowledge workers to be in a continuous learning mode. Learning organization and knowledge management together, will enable innovations to disseminate faster and widely within organization. It refers to knowledge generating, storing, sharing and transferring through series of learning channel and mechanisms such as training, tutoring, collaboration and involvement of employees and team work. Further, ease of communication within organization which allows them to have on time help on problems when it is needed. And technological tools and method are also included in this sense.

As analyzed in case studies, core values in Toyota such as Toyota Production System, Toyota Way, Genchi Genbutsu and Andon board are concluded after many years of experience by expertise and front line workers. Through their organizational learning structure with training, tutoring, these core values have been able to pass down generation to generation and make Toyota the leading automobile manufacturer in the world. Even some companies in other industry adopt their core value to their daily performance management work.

2. Phase two: Internal Business Process

In phase two, internal business process involves the main manufacturing and service delivering processes, which closely connects to the products and services to customers. Managers should know how well their business is running, and whether their products and service satisfy customer needs and requirements. This is realized though monitoring of critical performance improvement factors and implementation of performance improvement methods based on core value of Resource-based theory.

1) Resource-based theory:

Resource-based theory, as a leading value, helps to make full use of organizational capability, physical, human capital, and organizational resources in an efficient and effective way to reach sustainable competitive advantages in the market.

How to well organize these tangible and intangible resources in organization, in order to make them exhibits VRIO attributes, thus to achieve sustainable competitive advantage over other rivals in market, has become critically important in daily operation.

2) Critical performance improvement factors and methods

To start, measurement with critical performance factors in terms of resources, process, product & services and control described in Chapter 4.1, management leadership will have a basic understanding of organizational performance in these areas.

For resources, manufacturing capacity can be improved by utilization efficiency increase, absenteeism, scrap, rework and accidents reduce. Proper scheduled maintenance, scientific work methods, necessary concern in ergonomics design, employees' motivation and satisfaction will also promote optimization of resource utilization.

For process, cleanliness, layout in manufacturing plant should be properly arranged for smooth material flow and transport in order to ensure lead-times. Problems such as late deliveries and bottlenecks should be solved.

For control, we should evaluate the qualification of suppliers, assess the amount and type of product for outsourcing in order to align with strategic planning. Measurement is essential to reduce waste, save cost. Visualization through process map helps to make control of every step in manufacturing process, in order to identify defect, conduct root cause analysis, and avoid problems such as scrap and overproduction.

For product and service, a good design for assembly with modularization and standardization can help to control product variants, ensuring the quality of products and service delivered.

These performance improvement factors should be controlled and monitored on a regular basis by front-line workers, with weekly or monthly report delivered to management leadership so that they can have a detailed understanding of how well the process is running, what problems exist, as a reference in decision and strategy making. Also these factors can be used to balance and priories in feasibility report. Those choices and programs with best cost-efficiency ratio according to these factors

should be given prior consideration.

With problems and defects identified against standard, performance improvement work then can be conducted according to the methods described in Table 5 with regarding to logistics, production engineering, quality and other aspects. Capsugel's Six Sigma with quality management, speed, yield and downtime control and cost efficiency improvement, Toyota's JIT, TPS, Lean Production, are perfect internal business process examples. These performance factors and methods together, eliminate the gap between expertise and practical improvement activities, giving guidance and reference to conduct improvement work in daily life.

3) Customer/Stakeholder Theories:

Stakeholder theory expands organizational internal business process to the society, closely connects it with its customers, suppliers, employees, communities, shareholders, governments, etc. Recent philosophy has shown that customer focus and stakeholder satisfaction has been increasingly realized in terms of importance in business process. Through good implementation of stakeholder theory to reach consensus and mutual benefit. A win-win situation for company and its stakeholders is always welcome and appreciated. For example, Shell discussed in Chapter 3,keeps good communication with shareholders through annual performance report; emphasis on safety and respect to employees; evaluates suppliers with strict rules to obtain resources; sets global standards and regulations to deliver good product and service to customers; donates and supports local communities by investment, procurement and Shell's Live Wire; and of course Shell also keeps good relationship with governments, media, NGOs, etc, through endeavors and efforts.

- **Second part: Resulting Attributes**

3. Phase three: Risk and Opportunities in terms of Triple Bottom Line

After efforts in the first part, improvement work is supposed to give some benefit in financial return to multinational corporations. But many corporations found that it is not always favorable when they take environmental and social concerns through some evaluation method such as cost-benefit ratio, risk analysis, etc. A sustainable development according to Triple Bottom Line theory has widely accepted and adopted by many companies over the world. Investment and concerns in environmental and social issues may, in return, promote financial performance in long term even though they may cost in short period of time.

For example, Shell has devoted into environmental issues such as oil spills control, greenhouse emission control, minimization of freshwater use and recycling, biodiversity and habitat protection. These efforts wins Shell a good reputation, especially in oil and gas industry, which is considered to be the most polluted industry and helps Shell go through many crisis like Nigeria oil spill accident. In social dimension, investment and procurement in local community promotes local economy; employee training and care gives them more motivation in work. All these efforts, in return, accelerates its financial increase, which making more profit for itself in long-term period with healthy development.

Besides, organizational top leadership should be aware of the risk and opportunities related with considerations of cost, production, safety, time. A systematic analysis of its impact should be conducted and evaluated by a professional third-party organization. Leverage and balance between budget, resources, needs, safety, profit, as well as social and environmental impact should also be reached in terms of performance excellence.

This performance improvement model template presented above is one of the results in this research, and also can be considered as a recommendation for multinational corporations in their daily performance management work. The theories, methods, factors and model in this template can work as a guidance and reference to improvement work, thereby to reach performance excellence.

Chapter 6 Discussion

In this chapter, we will discuss how the problems and challenges have been solved and fulfilled. Furthermore, the limitations of the research will be discussed. Finally, the future research suggestion will be presented.

6.1 Results and critical review

- **Results:**

Some practical results have been abstracted from this research as a reference or instruction for performance improvement activities in multinational corporations. They are derived theoretically from the literature analysis of performance improvement methods and theories, as well as empirically from the case studies of multinational corporations.

In summary, the synthesized results are show as following:

1. The performance improvement problem and challenge, which are described in Chapter 1.2.
2. The performance improvement methods and theories' evaluation parameters, described in Chapter 2.
3. The critical performance factors, described in Chapter 4.1.
4. The process measurement model, described in Chapter 4.2.
5. The performance improvement model template, described in Chapter 5.

- **Critical review:**

In this part, we will review the problem and challenge described in Chapter 1.2,to see how this research solve these problems and fulfill the challenges.

1. Main objective of this research.

For this research, a practical performance improvement model template is expected for empirical implementation in multinational corporation(MNC).Like the figure shown below, it starts with problems and challenges in PI in MNC, through analysis of "new driving" PI theories such as Learning Organization Theory, Knowledge Management Theory, Triple Bottom Line Theory, etc, basic PI methods regarding manufacturing processed such as logistics, production engineering, quality,

etc, and case studies of MNCs in different areas in both manufacturing and service industry, a series of evaluation parameters and critical performance factors are abstracted as a reference to indicate start point in PI activities. Following the path indicated by Process Measurement Model, waste and defects will be identified. Performance improvement model template as a step by step workflow,shed light on how to organize, process the PI activities in implementation process.

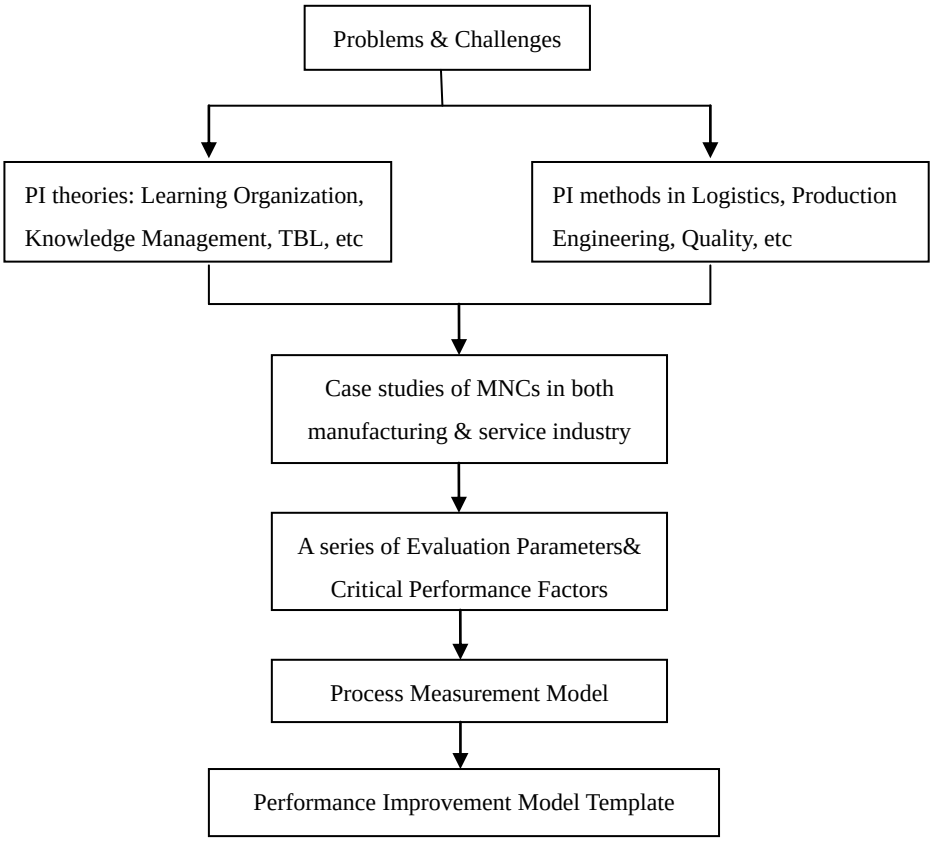


Figure 29 Research Structure and Results

Besides, the PI improvement theories and methods described in Chapter 2 can also be considered as a core value in the long-term corporation structure and culture building process.

In this sense, the main objective of this research should have been reached. Of course, the practical use of this research result in reality has to be checked and evaluated. It may varies from company to company, depending on their levels of market maturity, users' knowledge and skill, etc. Inevitable, some problems will occur with different situations happen in practice. Nevertheless, the research result has been given improvement support in MNCs, which satisfies the main objective.

2. Sub-objectives: problems and challenges of this research.

1) Specialist dependent

This research is conducted for practical use in MNCs, especially for those non-specialist front line workers, by providing them a systematic instruction. This systematic structure consists of three levels: evaluation parameters and critical performance factors, Process measurement model, and performance improvement concept (PIC).From front-line factors, workflow process, until implementation management concept,each level has detailed explanations and sufficient support. The criterion of specialist independence laid the foundation and possibility to start PI work.

2) Lack of support.

In the implementation process, some new ways and technology may not be accepted by front-line workers and resisted by their management level. However, this research is supportive with resistance problem for two reasons: First, the core value of stakeholder theory, mutual consensus and benefit as an organizational culture, which gains support from their stakeholder groups and management leaders. Second, as was discussed in Chapter 5.2,the new ideas and technology are introduced by their own working group, which can be accepted by training, learning through Learning Organization and Knowledge Management Theory implementation among their co-workers.

3) Competence or knowledge.

For the perspective of knowledge competence, all PI participants can gain knowledge and skill of production engineering and management through iterative improvement work. Selected participants through long-term organization training and learning culture influences, also have sufficient abilities of knowledge and skills to satisfy requirements.

4) Implementation.

Regarding deviations and errors in PI execution, this research result can also solve this problem in two ways. First, the execution process can be coached and led by Black Belt suggested in Six Sigma implementation in Capsugel case study, monitoring, control and revision work can be realized through Genchi genbutsu and Andon board suggested by Toyota Production Process in Toyota case study in the

improvement process. Second, the Process Measurement Model and Performance Improvement Model Template with its scientifically designed process and steps, will ensure that the performance improvement activities are conducted in the right direction.

5) Measurement.

This research is a fact based research with supportive criterions of measurement such as Critical Performance Factors in Chapter 4.1 and Process Measurement Model in Chapter 4.2. Performance Improvement Concept Model Template also emphasize on measurement to provide solid data for further improvement work.

6) Choice of improvement object.

For already known production process, critical performance factors seem not effective and helpful since participants are familiar with them. But for new production and service area, critical performance factors works as a reference to help management level to choose the best improvement objective, not only with great potential, but also accessible and applicable, from quantities of improvement areas and suggestions.

6.2 Learning from research

With wide range of research been gone through, the author has acquired with theoretical knowledge and practical methodologies as follows:

1. Industry development history and background, from industrial age to information and technology age.
2. Latest theoretical knowledge such as Learning Organization, Knowledge Management, Triple Bottom Line as new driving force in competitive environment.
3. Manufacturing process measure and control methods such as JIT, TPM, TQM, BPR, Six sigma and continuous improvement, etc.
4. Management core values and regulations in practice in automobile, pharmacy, quick service restaurant and oil & gas industries, in terms of innovation, learning, stakeholder theories, etc.
5. Research methods such as data collection, theory synthesis, case analysis and comparison, and model set up.

6.3 Challenges in writing process

The study has offered an evaluative perspective on performance improvement in multinational corporations, and was conducted through analysis of literature theories and synthesis of case studies. During the thesis writing process, the author has faced challenges as follows:

1. Since performance improvement is such a large extensive topic with many theories and methods, therefore, it is hard for the author to find proper latest improvement theories and connect them with a clear clue.

2. This thesis has conducted four case studies in order to show and analyze how multinational corporations improve their performance. Because all the cases are set in different industries with various organizational backgrounds, therefore it's difficult to compare them with same evaluation standard. Besides, there should be more case studies directly from industry in forms of interview, audit, survey, of which the author has endeavored so much to get the opportunities but without success.

3. This research has covered areas in resource, process, production, control and management. Furthermore, the cases, data and references, collected were collected from industries of automobile, pharmacy, quick service restaurant, and oil & gas, this wide coverage has actually challenged author with his limited knowledge and experience.

6.4 Future research

Based on the findings and limitations in this research, some suggestions for future research are proposed as followings:

1. A set of structured and systematic method consisting of improvement elements, approaches, tools and corporation culture should be developed since many companies simply take successful tools and concepts from successful cases, like Toyota Production System in Toyota, the culture, mechanism behind are always neglected.

2. There should be more research in the choice of improvement objectives and implementation process. Related decision making with experts and implementations with coach should be addressed

3. Other critical factors such as human factors and behaviors, which have great influence and determination in performance improvement work, should be studied.

Chapter 7 Conclusion

This thesis has identified background and challenges in market from industrial age to information and technological age for multinational corporations' development. An effective and efficient improvement performance improvement model template is needed.

It starts with literature review of some latest and driving performance improvement theories and methods, such as performance improvement & innovation, learning organization, knowledge management, resource-based theory, stakeholder theory, triple bottom line as well as some basic and popular methods adopted in manufacturing and service operations.

Further, though analysis of four case studies in different types of industries ranging from automobile, pharmacy, food supply chain to oil & gas, what to focus, where to start, and how to conduct performance improvement activities has been discussed and synthesized.

A series of critical performance factors has been concluded according to the operation process categories, combined with process measurement process, a performance improvement model template is carried out as a recommendation and result for multinational corporations to use and reference in their improvement activities. A continuous performance improvement work incorporating latest trends and driving forces is essential and beneficial to multinational corporations' long-term sustainable development in the future.

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